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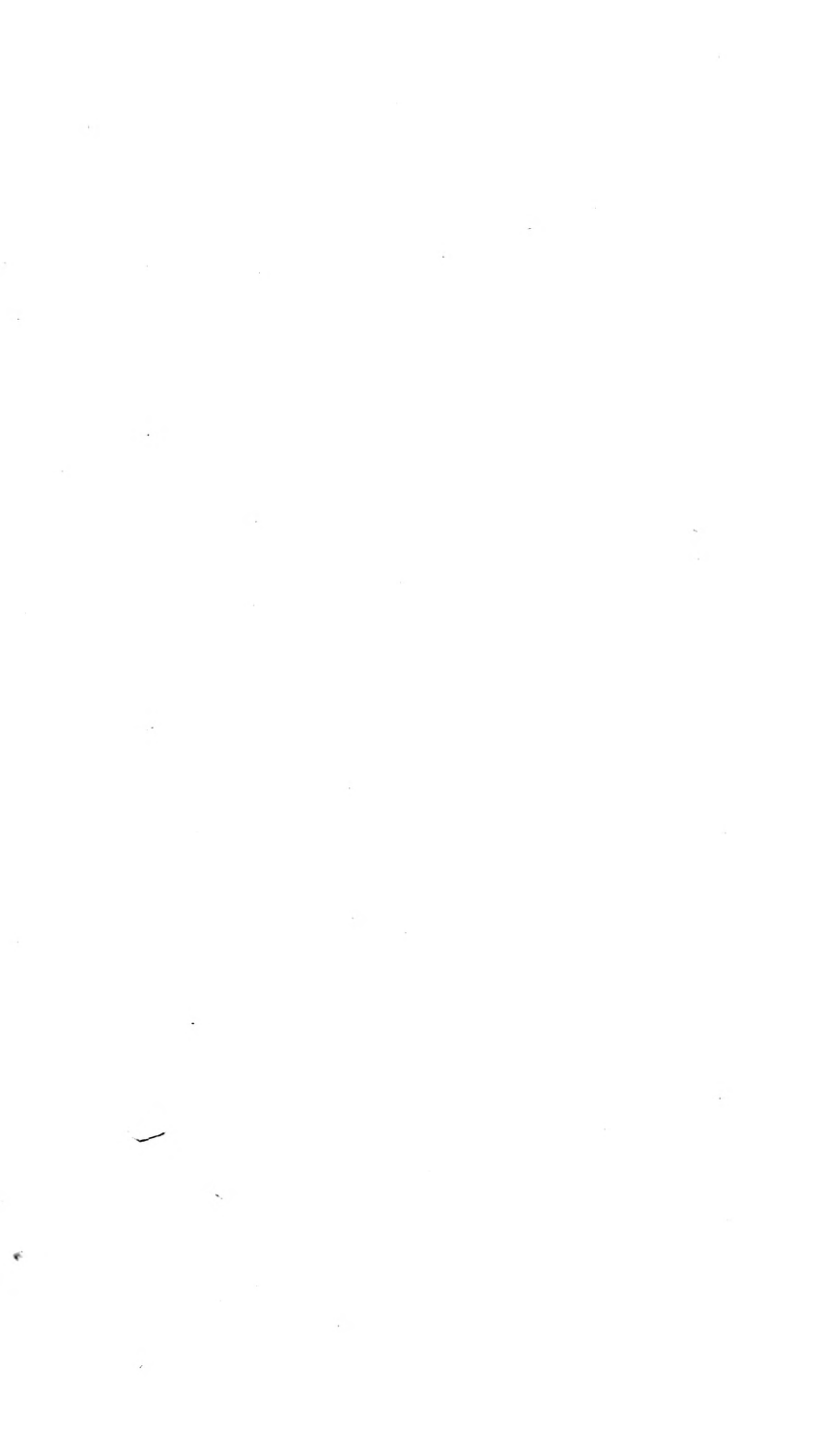
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THE

Massachusetts Agricultural

**REPOSITORY and JOURNAL.**

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VOLUME VIII.

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CONDUCTED BY THE TRUSTEES OF THE MASSACHUSETTS AGRICULTURAL  
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Vol. VIII.]

JANUARY, 1824.

[No. I.

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REPORTS OF THE COMMITTEES OF THE MASSACHUSETTS AGRICULTURAL SOCIETY, AS TO THE PREMIUMS AWARDED AT THE CATTLE SHOW AND EXHIBITION OF MANUFACTURES, HELD AT BRIGHTON, ON WEDNESDAY AND THURSDAY, THE 15th and 16th of October, 1823.

**F**IRST Committee, on Fat Oxen, Bulls, and Bull calves. The President, assisted by Hezekiah Gates, Esq. of Marlborough, and — Perry, Esq.

As chairman of the Committee on certain descriptions of Live Stock, I am about to report the decisions of that Committee, and to award the premiums to the successful competitors.

Before doing it, however, I hope I may be indulged with some prefatory remarks. They will be as *short* as I can make them, because I know the impatience of those who hope to find that they are among the *fortunate*, and I have not the vanity to believe, that I have the power either to instruct or entertain you—what I shall say, will be directed solely to the object of reconciling those who may be disappointed, not only in the awards of *this* Committee, but in those of all my brethren, and their assistant judges.

It would not do to compare this exhibition to a *lottery*, for that would imply the absence of all skill, judgment, and anxiety to do right; while in *this* case, every expedient has

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been adopted to secure competent skill, to exercise the soundest judgment, and with the deepest desire to give a just and impartial decision. We select the most experienced judges of animals—men, above temptation or bias. They undertake this laborious and unthankful office, without the hope, or the wish, of any other reward, than the promotion of the public good. We choose the best farmers as judges of working cattle and ploughing. We seek out the ablest and most skilful mechanics, (need I name such men as Mr. Moody, of Waltham, and Mr. Alger, of South Boston?) to judge of new inventions; we invite experienced importers or venders of manufactured goods, to examine the various and constantly increasing articles, which the ingenuity and taste of a country, preeminently distinguished for its inventive powers in objects of science and taste, the country of Fulton, and of a *greater* name, of Perkins, are constantly adding to the common stock.

It would seem, then, that we have done every thing in *our* power to secure intelligent and impartial awards; yet it must be seen and felt by every one, that in *one* respect, and in *one* respect only, a cattle show resembles a lottery; that point of resemblance is, that *as* in a lottery, *so* in these exhibitions, there are *many* blanks, and but *few* prizes; and would any fair man, and disinterested friend to agriculture and manufactures wish it to be otherwise? Would it be desirable, that *all* should draw prizes? There would be an end at once to all competition; there would be no reward to those, who by *patient* care, and cultivated ingenuity, had reared superior animals, or produced a fabric of superior beauty and durability. The very intent of these shows is to *discriminate* and reward *superior* exertions, and to encourage those who have come a *little* short of the prize, this year, to make their utmost efforts to excel in another. It cannot be too often repeated, that the task of judging is as *delicate*, as it is laborious and unthankful. It is unthankful, because the *disappointed* much outnumber the *successful*

candidates. It is also unthankful, because the committees may occasionally (though not often) differ from the *public* opinion; yet an intelligent and impartial public, and a fair and generous competitor, will admit the serious difficulties in the case, and that it is scarcely possible, that all men will think alike as to the *beauty* of an animal, any more than they agree in the relative beauty of their wives and children,—neither they will be more likely to agree in the other qualities of the animals, their aptitude for labour, their disposition to fatten; and still less, can uniformity of opinion be expected in the varied and ever changing forms, so arbitrary as in *fancy* articles of *manufacture*.

Having made these general remarks, applicable to all my friends and associates,—I will add one or two peculiarly adapted to my own branch of inquiry and decision.

As to fat cattle, there can be little difference of opinion. The animal has then run through his course; has performed his destined, and faithful and invaluable labours to man, and by a hard, but *inevitable* fate, he is to be submitted to the knife, and the sinews and muscles which turned the sod, are to be converted into the sustenance of man. He is, *when so fatted*, in his most perfect state, and skillful men (such I have had the pleasure to be associated with,) can *then* decide, which animal is, on the *whole*, the best. They can do this with so much accuracy, that they can *lay the ox* (as the phrase is) within a score of pounds of his *actual* weight, and they can even decide in most cases the quantity of fat, or tallow, which will be found in parts concealed from the eye.

Not so as to the *bull*. In judging of a bull, *many* properties, or qualities, are to be taken into the estimate; his carriage, whether erect or grovelling; his temper, whether ferocious or tractable, his eye, whether full or sunken, his neck and head, whether thin and delicate, or thick and fleshy; his coat, whether coarse, like that of a buffalo, or fine like that of a full blooded racer; his limbs, whether

stubbled and thick, like those of an elephant, or delicate, denoting activity and power, like those of an antelope; his forehead and chest, whether deep and powerful, indicating that he will produce a progeny calculated to tear up the stiffest soil, and to remove the heaviest rocks; and a hind quarter, fitted with muscles, which, when properly loaded with fat, will furnish an abundance of delicious food. There are many minor properties, such as the straitness and breadth of the back, and the elevated insertion of the tail, known to good judges, which I forbear to notice.

But my enumeration will satisfy any reasonable mind, that it is not *size alone* which can determine the preference, and that it is no light or trifling task to decide upon the properties of that noble animal, the bull; the parent, and the most important parent, of our most valuable domestic animal. I would not be *misunderstood*, when I call him the *most* important parent, I mean it simply in *this* sense; while *one* cow can transmit either her good or bad qualities to only eight or ten individuals, a good or bad bull may convey his good or bad properties to some hundreds.

The remarks I have made as to bulls, are equally applicable to *bull calves*, with one exception, which I beg every intelligent farmer to weigh. Bull calves are imperfect animals in a state of growth, often preternatural growth; as in man, we find children, often disproportioned when growing, and at mature age of the most perfect proportions; so bull calves of little promise, often become perfect specimens of their species, and the most perfect calves, when young, not unfrequently prove distorted, or coarse or ordinary, when arrived at maturity. I entreat your patience for these details, which seemed to me, however, necessary.

We award the first premium for a fat ox, to Asa Pond,

of Petersham; weight 2597 pounds,

\$30

The second premium for a fat ox, to Samuel Bowen,

of Adams, in Berkshire,

25



The third premium for a fat ox, to Amos Davis of Gorton; weight 2200,	\$15
The first premium for bulls, to Col. Jaques, of Charlestown, for his red bull, called Middlesex, out of Cœlebs, owned by him,	30
The second premium to Samuel Keir, of Charlton, for his bull out of <i>Holderness</i> , owned by Gorham Parsons, Esq. of Brighton, and much approved in that part of Worcester,	20
The third premium to Col. Jaques, of Charlestown, for his bull out of Cœlebs, called "Yankee,"	10
The first premium for bull calves, we award to Jacob Sawyer, of Westminster, <i>for a native bull calf</i> of a breed that has often gained our premiums, weighing at 7 months old, 725 pounds,	15
The second premium for bull calves is awarded to John Brown, of Dudley, for a bull calf of the <i>Holderness</i> breed,	10
The third premium for bull calves is awarded to Silas Stone, of Sherburne, Middlesex, for a calf out of Fill-pail's progeny, owned by Mr. Abner Wheeler.—Note, Fill-pail was presented to the Society by Col. Thorndike, and imported from the Netherlands. His progeny in the third degree inherit fully his qualities,	5

There were several other fine bull calves, among which I am requested by the committee to notice that of Nathan Nichols, of Malden, out of Cœlebs; that of William Dodge, and that of Daniel Stephens, of Marlborough.

Among many excellent bulls not included in the premiums, were a bull from Denton, by the Hon. Mr. Welles; Jupiter, a white bull, of Col. Jaques; the bull of Henry Rice, Esq. of the same breed, and a native bull, exhibited by David Perham.

It will be seen by this enumeration, that even the second and third crosses from the imported bulls, have car-

ried the premiums, and yet it was not in any degree owing to any influence which I, as a trustee, exerted over two very respectable citizens from the interior; I am only the organ to communicate their opinion, carefully formed, and cautiously expressed. It will, however, be seen, that some native bull calves, of a superior stock, carried the two first premiums; a proof that we need selection and care only, to make our own breed equal to any we could import. Yet we must rejoice at the opportunity we have had to cross our breed with the most improved of foreign countries. If no other effect should be produced, than that of exciting attention to the improvement of our native stock, all the care and expense hitherto bestowed would be only as the chaff is to the plump and healthy grain.

JOHN LOWELL, *Chairman.*

N. B. There was a cow exhibited, owned by Charles Vaughan, Esq. of Hallowell, which on several accounts, did not come within the list of our premiums.—Yet it would be improper not to notice her; she was from an imported breed, of great value, and she was without question one of the most perfect animals ever exhibited in Brighton.

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## REPORT No. II.

The Committee on Milch Cows, Heifers, Sheep and Swine, consisting of E. Hersy Derby, Esq. Willard Gay, Esq. of Dedham, and Abner Wheeler, Esq. of Framingham, report:

THAT there were three premiums offered for milch cows, for which there were twelve candidates, and after a long deliberation they have awarded the premiums in the following manner.

The first premium to the Rev. John B. White of East

Sudbury,

\$30

Second premium to the Rev. Samuel Capen, of South

Boston.

20

Third premium to Henry Rice, of Boston, for the  
Duchess of Marlborough, \$15

Mr. White who received the first premium, furnishes the following statement under oath. His is a native cow, raised by Mr. Noah Smith of Sudbury, is nine years old, and came into his possession in the spring of 1821. She calved on the 28th of May, the calf was killed the 11th of July. She has furnished one hundred and fifty-six pounds, nine ounces of butter, besides furnishing the family with a supply of milk. Weight of one quart of her milk, two pounds and a half. Weight of milk given in a day when the calf was a week old, besides what he would take, thirty-five pounds eight and three quarters of an ounce. Weight of milk when the calf was three weeks old thirty-two pounds, thirteen ounces. Weight of milk given on the day after the calf was killed sixty pounds. On the 27th of September, weight of milk given in one day, thirty-eight pounds, twelve ounces, fifteen quarts, one pint. On the 11th of October, thirty-six pounds, fourteen quarts, three one-fifth gills. From this it appears that the mean weight of milk given by the cow from the time when the calf was killed to the present, is forty-eight pounds a day. It also appears that when the calf was killed she gave milk at the rate of a barrel of thirty-two gallons beer measure in five and one third days, and that she now gives milk at the rate of a barrel in eight days and eight ninths of a day.

Mr. Capen, who received the second premium, stated under oath that his cow was raised by himself, is from a superior native cow and a bull of the Hon. John Welles's stock; is eight years old, calved the 2d of May, since which she has furnished two hundred and two pounds of butter; her greatest quantity of milk has been about sixteen quarts per day, of very rich quality.

Mr. Rice stated that his cow by Denton was three years old last February, she calved July 27th; she has given from the 9th of August, to the 13th of October, sixty-five days.

two thousand four hundred and eighty-one pounds of milk, averaging thirty-eight one fifth pounds per day.

The Committee noticed with pleasure two other very fine cows, one belonging to the Hon. John Welles, the others to Mr. Luke Fiske.

There were twenty-four Heifers entered for premiums, and your Committee had only three premiums to award. Among so many very fine animals, they found it extremely difficult to decide, and regretted that no distinction had been made in the premiums between those which had calved and those which had not. But taking into view every circumstance, they have been induced to award the first premium of fifteen dollars, to Mr. Samuel Jaques of Charlestown, for his full blooded short horned heifer of sixteen months.

The second premium of ten dollars, to Major Benjamin Wheeler, of Framingham, for his part blooded heifer of fourteen months old.

The third premium of seven dollars, to Col. Joseph Valentine of Hopkinton, for his native heifer of seventeen months old.

The Committee were highly pleased with several other heifers, and regret that they could not award more premiums. They feel desirous of noticing in a particular manner the five heifers by Denton, owned by his Honor Levi Lincoln, of Worcester, also five heifers offered by the Hon. John Welles of Dorchester, one by John Pierce Esq. of Roxbury; two by Jacob Knapp Esq. of the same town; one by George L. Stearns, of Medford; one by Samuel Brooks of Brighton; one by the Rev. Lemuel Capen, of South Boston; one by Dr. Codman, of Dorchester, and two full blooded young heifers by Col. Samuel Jaques of Charlestown.

In deciding the premiums on Merino Sheep, they have been governed more by the fineness of the fleece on every part of the same, than by the size and appearance of the animal, and have therefore awarded.

To Samuel Henshaw, of Boston, the first premium for the best Merino Ram,	15
To Samuel Jaques, of Charlestown, the second do.	10
To Samuel Henshaw, of Boston, the first premium for Merino Ewes,	20
To Samuel Jaques of Charlestown, the second do.	10

There were several other lots of Merinoes, all of which the Committee thought very highly of, several of which were very much superior in size and appearance to the ones to which they have awarded the premiums, but the quality of their wool was not of such exquisite fineness throughout. There were no Merino or native wethers offered for premiums. They were much gratified by the appearance of four long woolled sheep from the Netherlands, imported by Col. Jaques, who has made great exertions to introduce fine breeds of sheep into the country, but as the Society have not offered a premium for sheep of that kind, they could not award any.

The Committee award for the best Boar, the first premium to Gorham Parsons, Esq. for his Cobbet and Wellington boar,	\$12
For the second best to Silas Dudley, of Sutton,	8
For the third, to Francis Moore of Brighton,	5
For the best Sow, to Silas Dudley, of Sutton,	12
For the secondbest, to Gorham Parsons, Esq. for his Leicester Sow,	8
For the third, to S. W. Pomeroy, Esq. of Brighton,	5
For the best store Pigs, to Josiah P. Kenney, of Roxbury, the first premium,	10
For the second best, to Luke Fiske, of Waltham,	5
For the best spayed Sows, four in number, to T. P. Meriam, of Concord,	20

[Your Committee were much pleased with the appearance of these animals. Mr. M. furnished them with a description in writing of his mode of operation.]

Mr. Parsons desires the committee to state that he re-

linquishes the premiums awarded to him for his swine, having intended to enter them for exhibition only.

All which is respectfully submitted.

E. HERSHEY DERBY, *Chairman.*

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### REPORT No. III.

BRIGHTON, OCT. 16, 1823.

THE Committee on Agricultural Inventions, report :

That among the articles presented of this description, Safford's Straw Cutter, is, in their opinion entitled to the Society's premium, from its great simplicity as well as its effectual operation. The motion is communicated to the feeders directly by a double threaded iron screw, without bands or any complicated machinery. The knives are flat and oblong, and affixed to the radius of an iron wheel, and fixed and unfixed, and regulated with the greatest ease. The whole expense of the machine is fifteen dollars. It is said that it will cut a bushel of straw in a minute; and the testimonials in its favour are of the most decisive character, given by persons well acquainted with the use of such machines, who certify that "it exceeds any other they have ever seen, for cheapness, simplicity, despatch and durability." Your Committee therefore award to Mr. Safford the Society's premium of \$20.

A machine, called Jaquith's Threshing Machine, was presented for premium by the inventor. It is chiefly characterized by its being the application of the same wheels to the action of flails, which are fed by geer, or bands. The operation of the machine is very simple and effectual, and in the opinion of your Committee is the best, which has yet been presented, for *mowed grain*. Its expense is thirty-five dollars, when prepared for the hand, and seventy-five dollars when prepared for the horse power. Your Committee deem it entitled, and accordingly award a premium of twenty dollars; the proprietor adducing certificates, to the satisfac-

tion of the Chairman, that the machine has been used and approved by some practical farmer.

Walter Janes presented for premium, a Corn Shelling Machine, the principal component parts of which were a fluted cast iron cylinder hung under the segment of another fluted cast iron inverted cylinder. Without attempting further to particularize its conformation, your Committee deem it sufficient to state that it performed its operations well, and it is in their opinion an useful machine. Your Committee do not however, deem it so decidedly, if at all, superior to machines for a similar purpose used in this vicinity, as to justify them in awarding any premium; although they deem it well adapted for its purpose.

A Shearing Machine, presented by John T. Cambridge, of Springfield, Vermont, the operation of which is chiefly characterized by the horizontal motion and sliding action of the knife, by which it differs from similar machines in common use in our manufactories. It is a machine extremely handsome in its structure, and performs its work well; but not coming under the head of agricultural implements, is not embraced within the sphere of premiums, or the authority of the Society.

The same remark applies to a machine denominated "Jencks's Alleviator." This your Committee apprehend to be a very excellent invention, and is very powerfully recommended by Dr. Warren, of Boston, and others, for the raising of persons, whose limbs are fractured, while in bed, with great ease and safety. While your Committee consider it a machine of great practical utility in hospitals and sick chambers, they deem it not within the objects or power of this Society to award to it a premium.

Various agricultural machines were presented for exhibition only; among these your Committee particularly notice Mr. Pope's threshing machine, which on a former year obtained the Society's premium. It has been since improved, and now can thresh, as it is stated, with a hand power and

the assistance of three men, from eight to ten bushels of grain per hour; and enlarged, to the application of a horse power, will thresh per hour, from ten to fifteen bushels of wheat, and from fifteen to twenty of rye or oats.

Messrs. Lincoln Fearing & Co. also presented for exhibition a variety of agricultural implements, consisting of forks, ploughs, Eastman's straw cutter, from Baltimore, and Curtis's churn, from Connecticut; all of them to be found in their excellent and extensive collection of agricultural implements in Boston, and all machines of different degrees of merit, the particulars of which your Committee did not deem themselves called upon to estimate. They cannot fail, however, to express their gratification at the particular exertions of Messrs. Lincoln Fearing & Co. as well as at the general evidence of the increasing attention of the community to implements tending to improve and to lighten the labours of agriculture.

JOSIAH QUINCY,  
CYRUS ALGER,  
PAUL MOODY.

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#### REPORT No. IV.

BRIGHTON, OCT. 16, 1823.

THE Committee on Manufactures award

To James Shepherd & Co. of Northampton, for the best specimen of Broadcloth,	\$20
To Slater & Howard, of Oxford, for the next best,	15
To Thomas Dedman, of Templeton, for the best specimen of Woollen Cloth, of household manufacture,	12
To George M. Barrett, of Concord, for the next best,	8
To James Shepherd & Co. of Northampton, for the best specimen of Cassimere,	12
To the Wolcott Woollen Manufacturing Company, for the next best,	8
To Lincoln Burr of Hingham, for a piece of Kersey, second premium,	8



To Messrs. Pomroy & Clapp, of Pittsfield, for the best specimen of Sattinet,	\$8
To Seth Bemis & Co. of Watertown, for the next best,	5
To Mrs. Stephen Fay, of New Braintree, for the best specimen of household Flannel,	10
To Jonathan Wilder, of Sterling, for the next best,	7
To Ephraim Coburn of Dracut, for the best specimen of Linen Diaper,	5
To Gideon Delano, of New Braintree, for a piece of Linen Cloth,	8
To John Hunter, of New Braintree, for the best specimen of Floor Carpeting,	15
To Joshua Melville, of Concord, for the next best,	7
To Benjamin Poor, of Newburyport, for the best piece of Stair Carpeting,	10
To Theodosia Converse, for a specimen of fine Blankets,	6
To Anna Buckman, of Tewksbury, for a specimen of Linen Diaper Table Cloths, Worsted Stockings and Work Basket (as a gratuity.)	3
Also to Polly Leland for a piece of Cotton Diaper,	5
To P. Sandford, and brother, of Medway, for a specimen of fine Cotton Tread,	5
To Elizabeth Cowan, of Boston, for a specimen of Thread Lace,	3
To Ann Heath of Roxbury, for thirteen pair of Cotton Stockings,	5
To Mary Ann Plimpton, of Medfield, for a Straw Bonnet,	4
To Olivia Stanley, of Dracut, for do.	3
To Eunice Danforth, of Norton, for two extra fine straw Bonnets,	5
To Martha Hapgood, of Shrewsbury, for a Bonnet,	2
To Lavina Sweet, of Foxborough, for a Bonnet made from the husks of corn.	4

To M. W. R. of Boston, for a Cotton Counterpane,	\$5
To Misses Baxters, of Quincy, for a Hearth Rug,	3
To Sarah Cushing, of Dorchester, for a Rug,	3
To Jane Coburn, of Dracut, for do.	2
To Betsey and Mary Munroe, of Lincoln, for two Hearth Rugs, each,	2
To Caroline Cutting, of E. Sudbury, for do.	2
To Mehitabie Dean, of Mansfield, for do.	2
To Louisa Clark, of Boston, for do.	3
To Susannah Whiting of Cambridge, for do.	2
To Anna Bemis, of Watertown, for do.	3
To Mary B. Converse, of New Braintree, for do.	2
To Mrs. Elijah Warren, of Leicester, for do.	2
To Catharine Pierson, for three pair of fine Worsted Hose,	2
To Hannah Hawks, of Sterling, for do.	2
To Frances, Nancy, Elizabeth and Abiel Wheeler, of Worcester, for a specimen of Artificial Flowers, exhi- bited as the work of young children, each,	2
To John Thoreau & Co. for a specimen of Lead Pen- cils, manufactured from Plumbago, native of this coun- try,	5
To Marian R. Haven, of Hopkinton, for two Straw Bon- nets and Calash of Straw,	4
To Sarah Pollock, of Canton, for a Grass Bonnet.	4
To Susan Whitney, of Dedham, for do.	2
To Abigail Goodale, of West Boylston, for wrought But- tons and Frogs,	2
To Nancy Wheeler, of Worcester, for Tippetts of Tur- key Down,	2

A Bonnet from Plymouth, made of white paper, was considered by the Committee a curious and ingenious article, but they doubted whether it could be sufficiently serviceable to merit encouragement.

The number and amount of premiums on Factory Goods having been diminished since the last year, in favour of

household fabrics, factory Flannels were not a subject of premium the present year.

The best of the specimens sent for exhibition, from the Amesbury Flannel manufactory, were very fine and of excellent materials, and in all respects well finished. There were pieces of different qualities, but all creditable to the Company.

The Flannels from the Andover factory were better than any others exhibited.

The four pieces from the Salisbury Woollen Manufactory were substantial goods, but not in a finished style.

Many of the specimens of Household Industry, exhibiting a commendable taste, ingenuity and skill, are not rewarded by gratuities, not because they were undeserving this distinction for any deficiency in the qualities mentioned, but because it was necessary to put a limit somewhere to this kind of reward; the Committee have therefore conferred it on some of the most useful articles only. Much praise, however, is due to Miss Merrill, of Salisbury, for a parcel of fine Linen Thread; to Hannah Edson, of Hardwick, for Worsted Socks; to a Lady of Plymouth, for a Paper Bonnet; to T. P. Meriam, of Concord, for a specimen of Stocking Yarn and a pair of Socks; to Mrs. Robinson, of Worcester, for Stockings and Socks, and to Mary Adams, for a specimen of good Carpeting.

The pieces of Calico from the Charlestown Bleachery (a recent establishment) were thought by the Committee to be excellent goods, and far preferable for durability to English calicoes of the same description.

A very fine Beaver Hat was exhibited by Messrs. Dikeman & Shepard, of Northampton. The committee could conceive of no improvement beyond it.

The case of Hats, from the Boston Manufacturing Company, were of the first quality of gentlemen's hats. This Company have in former years deserved and received the

commendation of the Committee on Manufactures, whose favourable judgment has been confirmed by the public. It is understood that the importation of men's hats, even of the best qualities, is now very small.

The two parcels of Sail Cloth, one by Mr. George B. Chase of Salem, the other by Mr. George Johnson, of Cambridgeport, were pronounced by competent judges to be without fault, and these gentlemen have therefore secured to themselves a good prospect of the public patronage.

Four pieces of black Broadcloth, offered for exhibition only by the Wolcott Woollen Manufacturing Company, were very creditable to the makers, and with a little more skill in the finishing would have approached very nearly to those which obtained the first premium.

The best of the Broadcloths, Cassimeres, and Sattinets, were much superior, in all respects, to the same quality of goods exhibited at Brighton in any previous year.

RICHARD SULLIVAN, *Chairman.*

EDWARD TUCKERMAN,

JOHN LEMIST.

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## REPORT No. V.

BRIGHTON, OCT. 16, 1823.

THE Committee appointed to award premiums on the Ploughing by single teams, or one yoke of oxen, have attended to the duty assigned them, and report as follows, viz : —That nine persons entered as competitors, and drew from the eleven lots laid out by the Committee of Arrangements as follows :

No. 9.—Joseph Dudley, of Sutton, himself ploughman, ———, driver. Work performed in 26 minutes—12 furrows turned.

No. 10.—Lincoln Fearing, of Boston, E. Cushing, ploughman, Giles Woodman, driver. Work performed in 29 1-2 minutes—10 furrows turned.

No. 11.—Silas Dudley, of Sutton, himself, ploughman, Isaac Hathaway, driver. Work performed in 31 minutes—13 furrows turned.

No. 12.—Leonard Stone, of Watertown, Solomon Sargent, ploughman, Jonas Smith, driver. Work performed in 28 1-2 minutes—13 furrows turned.

No. 13.—Isaac Cook, of Brookline, Isaac Cook, jr. ploughman, Isaac Cook, jr. driver. Work performed in 35 minutes—13 furrows turned.

No. 14.—Stephen Marsh of Sutton, Simeon Phelps, ploughman, Stephen Marsh, driver. Work performed in 27 minutes—12 furrows turned.

No. 15.—Aaron Davis Williams, of Roxbury, Lewis Barker, ploughman, Lewis Bliss, driver. Work performed in 32 1-2 minutes—14 furrows turned.

No. 16.—Joseph Miles of Concord, Silas Lee, ploughman, Joseph Miles, driver. Work performed in 25 minutes—11 furrows turned.

Your Committee feel it a duty to report, that all the work was well performed, and did great credit to the performers; but having only three premiums to bestow, after due deliberation, having examined the work carefully award as follows:—

To Isaac Cook, Brookline, the first premium,	\$15
Isaac Cook, jr. as ploughman,	8
Isaac Cook, jr. having no driver,	4
	<hr/>
	\$27
To Aaron Davis Williams, of Roxbury, the second premium,	\$10
Lewis Barker, Ploughman,	5
Lewis Bliss, Driver,	3
	<hr/>
	\$18

To Silas Dudley, of Sutton, the third premium,	\$6
Silas Dudley, as ploughman,	3
Isaac Hathaway, driver,	2
	<hr/>
	\$11

The Committee found some difficulty in awarding the premiums, and regretted that they had not at least one more to bestow, but have endeavoured to award in the best manner the nature of the subject would permit. All which is respectfully submitted. (Signed)

GORHAM PARSONS, *Chairman.*

ICHABOD NICHOLS,

FRANCIS WINSHIP.

#### REPORT No. VI.

BRIGHTON, OCT. 16, 1823.

THE Committee on the Ploughing Match of *two pair* of oxen to plough one quarter of an acre, consisting of John Prince as chairman, and Josiah Titcomb and Paul Upton, beg leave to report their opinion and award of premiums:

That four ploughs only were entered to contend for the three premiums; that the ploughmen drew for lots as follows:

No. 1.—John Sherman, of Sutton, with plough and wheel on the end of the beam, made by J. Hall, of Sutton—said Sherman himself ploughman, and Austin Sherman, driver.

No. 2.—Stedman Williams, of Roxbury, plough made by Jesse Warren, of Dedham, with wheel on the beam—said Williams, ploughman, and Samuel Prime, driver.

No. 3.—Joseph Curtis, of Roxbury, plough made by Jesse Warren, of Dedham, with wheel and cutter—Amos Wyman ploughman, and Aaron Stone, driver.

No. 4.—Aaron Davis Williams, of Roxbury, plough made by Jesse Warren, of Dedham, with wheel and cutter—Thomas Howe, ploughman, and David Howe, driver.

The rules and regulations were explicitly stated to the

ploughmen, particularly that *goodness of work*, the *state* of the cattle when finished, and *time*, would be taken as criterions in deciding the premiums; and that the Committee did not wish the cattle to be *hurried*, as good work could not be well done, when over driven. They have great satisfaction in stating that the work was all exceedingly well performed, and the cattle came out in good order and could all of them, with ease, have proceeded to double the work, if required. The only difficulty the committee experience is in deciding, and they trust, from the pains they took, that the unsuccessful competitor will not feel dissatisfied, although he was the only one that could not obtain a premium; they much wish they had a fourth to give him.

No. 1 finished their task in 48 minutes 20 seconds, with 28 furrows in 24 feet width, making 10 1-3 inches per furrow—the cattle 3 and 4 years old.

No. 2 finished in 44 minutes 20 seconds, with 26 furrows in 24 feet, making 11 inches per furrow—cattle 3 and 8 years old.

No 3 finished in 49 minutes 30 seconds, with 26 furrows in 24 feet, making 11 inches per furrow—cattle 7 and 8 years old.

No 4 finished in 49 minutes, with 28 furrows in 24 feet, making 10 1-3 inches per furrow—cattle 6 years old.

The chairman having stated his wish to the others of the Committee that they should agree on the premiums, if not, he would be called to the unpleasant task of deciding—which he is happy to inform the Trustees he was not required to do, the committee agreeing in opinion to award as follows:—The first premium to

Stedman Williams—plough,	\$15
Himself, ploughman,	8
Samuel Prime. driver.	4

Second premium.—John Sherman—plough,	\$10
Himself, ploughman,	5
Austin Sherman, driver,	3
	<hr/>
	\$18
Third premium,—Aaron D. Williams—plough,	6
Thomas Howe, ploughman,	3
David Howe, driver,	2
	<hr/>
	\$11

They feel themselves in duty bound to state, that the goodness and well training of the three and four years old cattle of Mr. Sherman would have given him a fair claim for the first premium, had he not made two or three baulks in his work. They would also state, that the work of Mr. Curtis's plough was very fine, but rather shallower than their rule, or that of any other plough.

The Committee feel satisfied that all engaged exerted themselves to their utmost in doing good work, and they only regret, that there had not been more competitors, that they should not have had the unpleasant feelings of leaving a solitary, faithful and deserving one.

JOHN PRINCE,  
JOSIAH TITCOMB,  
PAUL UPTON.

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#### No. VII.—ON WORKING CATTLE.

THE Committee of the Massachusetts Society for the Promotion of Agriculture, consisting of Messrs. John Welles, Silas Gates, Elijah Perry, and Nathaniel Tucker, having been appointed to consider the several claims for premiums to the Working Oxen, duly entered at the Cattle Show at Brighton, on the 16th of October, 1823, have attended to that duty, and report: That they are enabled to congratulate the Society upon the good effects of the encouragement given by them to the rearing, training and improving of the



Ox Team, of the importance and utility of which they have a strong sense.

Ten yoke of Cattle were entered to contend for the premium, and they did honour to the farmers who owned them.

The Committee proceeded to compare them in reference to their *age, strength, size, form, and beauty, equality of match, and other general circumstances*; and after a minute examination, and such test of their power and training as could well be had, they award as follows:—

To John Sherman, of Sutton, his twin cattle, four years old, first premium,	\$30
To John Scammel, of Bellingham, his cattle, four years old, second premium,	25
To Isaac Hathaway, of Sutton, his cattle, four years old, third premium,	20
To Stephen Marsh, of Sutton, his cattle, five years old, fourth premium,	15
To Isaac Stone, of Watertown, his cattle, five years old, half of fifth premium,	7 50
To Simeon Phelps, of Sutton, his cattle, four years old, half of fifth premium,	7 50

The Committee have a full conviction of the motives of the “Society for the Promotion of Agriculture,” in extending to the simple operations of labour, by the best selected and judiciously trained cattle, in five several gradations, the most liberal encouragement and reward. The admirable fitness of this power, in cultivation, for our soil,—its cheapness of support,—the ease with which it is reared,—its certain and regular increase in worth, and its intrinsic value in case of accident, should be sufficient inducement to its universal use, and preclude the necessity of persuasion.

But the fact is not to be disguised! The Horse is too often substituted for the Ox, and when maintained beyond necessity, becomes a source of consuming expenditure. The great increase of this animal has, in several parts of Europe.

been thought the means of public inconvenience and distress.

Is it not then a dictate of sound consideration with the Farmer, not to multiply the Horse the greatest consumer of all animals of the means of support to man beyond his convenience and necessity ; whose value depends on so many casualties, and ceases with his breath, in preference to the Ox, whose utility has been tested by long tried, and well founded experience ? who when he ceases to improve is made to add to our means of support, and to enlarge the interests of the community ; every effort to advance which, should be zealously supported by the Agriculturists of Massachusetts.—All which is submitted by

JOHN WELLES,  
SILAS GATES,  
ELIJAH PERRY,  
NATHL. TUCKER.

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#### REPORT No. VIII.

BRIGHTON, OCT. 16, 1823.

THE Committee on Agricultural Experiments, to whom was also committed the inspection of sundry articles of manufacture, for which premiums were offered, report :

That six parcels of Cheese, of more than a year old ; and fifteen parcels of new Cheese, were offered for the Society's premiums ; much of it, in the opinion of your Committee, superior to any hitherto exhibited ; marking, most evidently, improvement in the quality of this article. All the Cheese exhibited was from the town of New Braintree, in the county of Worcester ; excepting one parcel of four Cheeses, entered by Mr. Jacob Osgood, of Andover, in the county of Essex, which was well made and of good quality. Of the old Cheese, that from the dairy of Mr. Job Rainger, was considered to be the richest and best made, and is entitled to the premium of ten dollars ; that from the dairy of Mr. Elisha Mathews, the next best, and is entitled to the premi-

um of five dollars. Of the new Cheese, that from the dairy of Mr. Joseph Green, was adjudged to be the best, and is entitled to the premium of ten dollars; that from the dairy of Mr. Alpheus Gilbert, the next best, and is entitled to the premium of five dollars.

Ten specimens of Butter were entered for premium, most of which is of an excellent quality; that from the dairy of Mr. Jonathan Upham, of Newton, was considered to be the best, and is entitled to the premium of fifteen dollars; that from the dairy of Stephen Hastings, of Sterling, the next best, and is entitled to the premium of ten dollars; that from the dairy of Mr. Jephthah Parker, of Chelmsford, the next best, and is entitled to the premium of seven dollars; and that from the dairy of the Rev. Lemuel Capen of South Boston, being in lumps, and made in June last, the next best, and is entitled to the premium of five dollars.

Mr. Gideon Delano, of New Braintree, offered specimens of Butter, and Cheese, which are of a good quality, made between the 15th day of May, and the first day of October, from ten cows, fed exclusively upon grass; the entire quantity of Cheese being two thousand seven hundred and forty-four pounds, and of Butter one hundred and seventy one pounds. Your Committee recommend that the premium of twenty dollars be granted to said Delano.

Mr. Samuel Hobbs, of Weston, is entitled to the premium of ten dollars, for the best dressed Calf Skins; and Mr. H. H. Hide, of Framingham, to the premium of five dollars, for the next best.

Five sides of Sole Leather were entered by Messrs. Benjamin Myrick & Co. of Roxbury, but your Committee did not consider them sufficiently well manufactured to be entitled to the Society's premium; the leather not being of an uncommon good quality.

Four specimens of Currant Wine were entered for the Society's premium; that offered by John Prince, Esq. was considered to be the best, and is entitled to the premium of ten

dollars; John Kenrick, Esq. of Newton, is entitled to the premium of five dollars, for the next best.

A specimen of Wine made from the Elderberry, by Thomas Spencer, of Beverly, was exhibited; it appeared to be a pleasant, and is said to be a wholesome liquor, but one on which no premium was offered by the Society; your Committee recommend that a gratuity of three dollars be paid by the Treasurer to said Spencer.

Some canisters of Mustard, manufactured by Messrs. Bickford & Kellogg, of Boston, were entered for exhibition, and were found on trial to be equal, if not superior to any imported; no premium was offered by the Society for this article.

By order of the Committee,  
THOMAS L. WINTHROP, *Chairman*,

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#### REPORT No. IX.

THE Committee on Agricultural Experiments submit for the consideration of the Board of Trustees the following, in addition to their Report dated the 16th day of October last, to wit:

That Col. Joseph Valentine, of Hopkinton, in the County of Middlesex, is entitled to the Society's premium of thirty dollars, for having raised the greatest quantity of Indian Corn, being one hundred and twenty-seven bushels and 29-32 of a bushel, on one acre of land. Col. Valentine's description of his culture is as follows:—"The quality of the soil is a deep yellow loam, situated on a western declivity, and naturally moist. The land has been improved for mowing six years last past, and until the last year it has yielded very heavy crops. In July, 1822, the crop of hay falling below the produce of former years, I thought it expedient to stir the ground; in August following the ground was broken up, and in November it was harrowed, and cross ploughed. In the spring of 1823, it was again ploughed, and harrowed, and twenty loads of green barn manure

spread equally over it, and ploughed in. It was then furrowed in rows about three feet and six inches apart, with a large horse plough, the plough going twice in each row to make a deep channel for depositing the compost manure, and also to leave the seed when planted, lower than the general surface of the ground. The rows thus prepared, were filled with twenty loads of barn, hog-yard, and night manure, well mixed, and pulverized with Smithfield lime; the manure was then levelled, and the kernels of seed placed about ten inches apart widthwise, and four inches lengthwise in the row, and covered lightly with fine mould. The seed was the yellow twelve rowed corn, which was soaked in a strong saltpetre brine twenty-four hours, and then spread, sprinkled with quick lime and raked over until completely coated with lime; it was ploughed twice, and hoed three times at the last hoeing; the first of July, the suckers were pulled out, and in the fore part of August, the suckers were again pulled out, and the false stalks cut away. In hoeing the corn I was particularly careful to loosen the soil and remove the weeds without raising the earth about the stalks, as I had usually done; the stalks would average from nine to ten feet high, and were cut the first week in September. The first week in October the corn was harvested, and carefully measured in baskets by two of my men who had assisted in cultivating the crop. I directed the same men to take each of them a basket and fill it with ears in the same manner as when they measured the whole, and to shell and measure the quantity of shelled corn obtained from a basket of ears; the amount of shelled corn from each basket of ears was the same, viz., nineteen quarts; and when turned together and measured, the result was one bushel and six quarts and a fraction over, from the two baskets. By computing the produce of the whole acre from the quantity of ears as measured in the basket, and the amount of shelled corn contained in a basket of ears, the result will be one hundred and twenty-seven bushels and twenty-nine quarts of

shelled corn, weighing between sixty and sixty-two pounds to the bushel. The field in which the above acre was measured contains three acres; one half of which was planted with seed prepared as above stated; the other half was planted with seed prepared in its natural state. The corn in every part of the field came up well; and as the ground was all manured and cultivated alike, there could be no difference in the quality of the soil, to invite or repel insects and vermin. But in that part which was planted with seed in its natural state, at least one sixth part of the blades were eaten off and destroyed by the worms, while in the part planted with seed soaked in brine and coated with lime, not a single blade was discovered that had been attacked by them. This is the first experiment I ever attempted to prove the utility of securing corn against the ravages of the worm by any process applied to the seed. Perhaps the mode above described and pursued by me, may not always be attended with the like success. It may, however, be the means of exciting the attention of others who have more leisure and ability than myself, to discover and apply a certain remedy for so great a hindrance to the farmer. The value of the stalks and fodder I consider equal to one ton and a half of English hay; the entire expense of cultivating this acre of corn, including thirty dollars for the forty cart loads of manure, was fifty-five dollars and seventy-five cents." Col. Valentine is also entitled to the premium of twenty dollars, for having raised the greatest quantity of wheat, being thirty-seven bushels and one fourth of a bushel on one acre. "In the spring of 1822, it was ploughed and planted with Indian corn, forty loads of manure were spread and laid upon it, and the crop produced was one hundred and sixteen bushels and twenty-eight quarts of corn, well dried and fit for use. In the spring of 1823, as soon as the ground was fit for ploughing, I had it ploughed twice and harrowed; three bushels of Gilman wheat were sowed on one acre and a few rods,

and ploughed in ; I then sowed twelve pounds of clover, and half a bushel of herds grass seed, spread one hogshhead of slacked lime upon the land, and harrowed it well twice with an iron harrow. The wheat before sowing was washed clean in clear water, then soaked forty eight hours in strong lime water, then laid on a dry floor and slacked lime sprinkled upon it, and frequently stirred until it was covered with lime. Such was my practice with the seed. In the month of July I employed a surveyor to measure the land on which the three bushels of wheat were sowed, and found it to contain one acre and a few rods over ; the number of rods exceeding one acre were staked off, and the wheat growing thereon was reaped and threshed by itself ; the produce was between one and two bushels ; the acre was reaped and bound with long rye-straw, and found to be seven hundred and sixty-two bundles, making fifty shocks and twelve sheaves. When threshed, winnowed and measured, the produce of the acre was found to be thirty-seven bushels and one fourth of a bushel ; the quality of the grain was excellent, not a kernel of smut or burnt grain could be found, and the straw was perfectly clear and bright ; the kernel was very large and full. Many persons have examined it who have been acquainted with the culture of wheat in the western country, and they pronounce it equal to the produce of the new land growth. Its weight is sixty pounds to the bushel."

That Silas Pearson, of Newbury, in the County of Essex, is entitled to the Society's premium of twenty dollars, for having raised the greatest quantity of Barley, being fifty-two bushels and eighteen quarts upon one acre of land. "The entire lot contains one acre and fifty-three rods ; the soil is a gravelly loam ; in 1822, it was planted with potatoes, and manured with about twenty ox cart loads of compost manure to the acre, which produced a handsome crop ; in April, 1823, it was ploughed plain and harrowed, the seed was then sowed and covered with a harrow, which took four bushels of the two rowed kind ; the crop was mowed and

threshed out in August, and the amount was seventy bushels, at fifty pounds per bushel."

That John Prince, Esq. of Roxbury, is entitled to the Society's premium of twenty dollars, for having raised the greatest quantity of Mangel Wurtzel, being seven hundred and sixty-two and a half bushels, on one acre. "The land was cultivated in 1822 with corn, potatoes, and winter squashes, in alternate rows, and sixteen or eighteen cart loads of compost manure (one half meadow mud) to the acre. It is almost on the top of my hill, is gravelly loam, or a hard pan bottom, inclining to the S. S. E. This season twenty-four cart loads of the same kind of compost manure were spread on the whole flat, and ploughed in, then harrowed flat, and a common marker made the furrows about two inches deep, and two feet apart, the seed was dropped about five or six inches apart, and covered up on the third of May. From the 11th to the 16th of June, they were hand hoed, weeded, and thinned out to ten or twelve inches apart; on the 1st of July a second and last hoeing and weeding. In August and September were too thick, some were drawn for hogs. In October, by measurement, one hundred and twenty bushels were drawn on one end of the field:— and on the 4th and 5th of November the whole crop was drawn and carted to the barn cellar, and part were pitted in the field, as described in the Massachusetts Agricultural Repository, No. 3. vol. VI. particularly those intended for seed the next season. Eight rows on one side, and the whole length of the field, was the sugar beet, from seed I imported two years since from France, and am much pleased with them; I think they produce fully as much as the mangel wurtzel, weigh five or six pounds per bushel heavier; and contain more saccharine matter than any vegetable we cultivate; I therefore intend next year to cultivate largely of them; and also to raise much of their seed from very fine roots selected for that purpose, and such as I sent to the Society's Hall on the day of the late Cattle Show. Very



many of both kinds weighed twelve and fourteen pounds each. I weighed about seventy baskets of the mangel wurtzel to give me a fair average of the crop, having filled the carts as nearly equal as possible, and the produce was fifty-four thousand four hundred and fifty eight pounds, which, at fifty-six pounds, make nine hundred and seventy-two and a half bushels on one acre and forty-three rods of land, as appears by the surveyor's certificate herewith transmitted. The entire expense of cultivation was sixty dollars and 14-100; at this rate each bushel costs a little more than six and a quarter cents, and the produce forty-two thousand nine hundred and twenty pounds, or seven hundred sixty-two and a half bushels per acre.

In the same field, and directly alongside, potatoes were cultivated, which fell considerably short of two hundred bushels per acre. The labour in gathering potatoes, is much more than the mangel wurtzel; and on the whole, cultivation about equal. I think one bushel of potatoes about equal to one and a half of mangel wurtzel for feeding animals; the same might be allowed of carrots for milch cows, for other animals not so much; all cattle are fond of mangel wurtzel; they are not subject to be attacked as the ruta бага, by the fly in seed leaf, or the cabbage louse, which sometimes destroys whole crops, and they give no bad flavor to milk. On the whole, after five or six years cultivation of the mangel wurtzel, I feel convinced it is the most profitable root to cultivate for consumption on a farm, and the past season mine kept perfectly well till June."

That Messrs. Tristram and Henry Little of Newbury, are entitled to the Society's premium of \$20, for having raised the greatest quantity of turnips, being nine hundred and eight bushels on one acre. "The lot is on the north side of a small swell on our farm in said town, the soil is a yellow loam, or a gravelly bottom, and had been down to grass two years; in July 1823, the lot was mowed and the hay made on the same land, and the produce was one ton and eight

hundred ; the swards was then ploughed as deep as would turn over, and twice harrowed, furrows were then opened at the distance of three feet apart, ten ox cart loads of manure, mixed with ten loads of marsh mud, or sod, was put into the furrows, which were covered with a plough ; one pound of seed was sowed with a machine, one row on each ridge, and a roller was made to pass over the same, which completed the sowing ; as soon as the third leaf was grown, they were thinned to the distance of one foot apart in the rows, after that they were three times ploughed between the rows, and twice hoed ; the harvesting was in November, and the product was nine hundred and eight bushels. The labour of cultivating and harvesting the above crops, exclusive of hauling them to market, for they were all sold, was for the hay, two days work, and for the turnips twenty-six and a half days."

Messrs. Tristram and Henry Little also claim the premium of \$20, for raising the greatest quantity of common turnips, after any other crop in the same season, having raised nine hundred and eight bushels on one acre, and the same is awarded to them.

Claims for premiums were also exhibited to your Committee, by the following persons, for raising the greatest quantity of Indian corn on one acre of land, to wit : Messrs. Tristram and Henry Little, of Newbury, raised one hundred and fifteen bushels and one quart ; Mr. John Lees, of ditto, one hundred thirteen and a half bushels ; Mr. Fitch Winchester, of Southboro', one hundred and two bushels and seventeen quarts ; Gen. William Hull, of Newton, raised one hundred and thirteen bushels of corn on one acre and twenty-five rods—Gen. Hull sent to your Committee some fine ears of corn, taken from stalks cut from his field early in September last, before there was any frost, and while corn was in the milk ; "in the last of October the corn was found to be perfectly ripe, and sound, and the stalks sufficiently cured to be packed in the mow." The result of this experiment ap-

pears to be highly satisfactory, and Gen. Hull and your Committee recommend that his communication on the subject be published in the Society's Journal. Mr. Joseph Little, of Newbury, raised six hundred and thirty-six bushels of common turnips on one acre. Mr. Benjamin Savory, of Byfield, raised fifty bushels of spring wheat on one acre and one hundred and forty-six rods. Mr. Ebenezer Gates, of Worcester, raised fifty-five bushels of winter rye on one acre and one hundred and thirty rods; no premium was offered the present year for raising the greatest quantity of rye, but your Committee are induced to recommend that the Treasurer be authorized to pay said Ebenezer Gates, the sum of \$20.

For the most satisfactory experiment to ascertain the best mode of raising Indian corn, whether in hills or in rows; for raising the greatest quantity of vegetables; grain, peas, and beans excepted, for winter consumption of the stock on his own farm, and not for sale;—for raising the greatest quantity of winter wheat on one acre; for raising the greatest crop of millet on one acre, cut and cured for hay; for raising the greatest quantity of carrots, not less than six hundred bushels, on one acre; for raising the greatest quantity of potatoes on one acre, not less than five hundred bushels; for raising the greatest quantity of common beets on one acre, not less than six hundred bushels; for raising the greatest quantity of parsnips on one acre, not less than four hundred bushels; for raising the greatest quantity of Ruta Baga on one acre, not less than six hundred bushels; for raising the greatest quantity of onions on one acre, not less than six hundred bushels; for raising the greatest quantity of cabbages on one acre, not less than twenty-five tons weight, free from earth when weighed; for the most satisfactory evidence on soiling cattle, not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated; for making the experiment of turning in green crops as a manure, on a tract not less than one acre, and proving its utility and

cheapness, giving a particular account of the process and result; for proving by actual experiment the best season and mode of laying down lands to grass, whether spring, summer, or fall seeding be preferable, and with or without grain on different soils; for raising the greatest quantity of dry peas on one acre, not less than thirty bushels; for raising the greatest quantity of dry beans on one acre, not less than thirty bushels; for giving proof of having produced the largest quantity of dressed flax, raised on half of an acre, not less than two hundred and fifty pounds; for taking up in one season, on his own farm, the greatest quantity of honey, and at the same time exhibiting superior skill in the management of Bees; for proving by satisfactory experiments to the satisfaction of the Trustees, the utility and comparative value of the cobs of Indian corn, when used with or without the grain itself, ground or broken, no claims for premiums have been exhibited.

For the Committee,

THOS. L. WINTHROP, *Chairman.*

*Boston, Dec. 13, 1823.*

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[The following communications were made by sundry gentlemen who were competitors for the premiums on Agricultural Productions, but did not obtain them, owing to the greater success of others. We thought it but a proper piece of respect to them to publish their communications.—By them the public will learn also, that the zeal and skill of our farmers is extensively diffused.]

#### ON INDIAN CORN.

**I**N July 1821, after mowing the piece of land containing about one and three quarters of an acre, I ploughed and planted the same with Virginia Corn for fodder, using about ten loads of yard manure in the hill, and hoeing it once, I commenced cutting and giving them to my cattle the first of October, at which time they began to tassel; after using them all, I again ploughed it. In the spring of 1822, twice ploughed the ground after spreading about twenty-five loads of

green barn manure and putting a shovel full of manure in each hill, procured from the yarding of ten cows and five hogs together, drawn out of the yard into a heap the fall before, I planted with corn and pumpkin seed. I discovered in July that the corn was suffering great injury from the pumpkin vines, by their running up the corn and shading the ground by covering it in such a manner, that if there was no corn upon the ground, it would have been completely covered with pumpkin vines, it finally produced sixty bushels to the acre, of corn, and a few loads of pumpkins. After harvesting I again ploughed it, and in the spring of 1823, I ploughed it three times and harrowed it as often, previously spreading about twenty-five loads of green barn manure, then furrowing about three feet apart each way, I planted with five kernels of yellow and red eight rowed corn, putting a shovel full of yard manure in each hill, produced from yarding the above mentioned stock, a sufficient quantity of loam being usually carted into the yard, as would increase the whole to about one hundred loads, all which was used upon that  $1\frac{1}{2}$  acres, and another containing one and a half acre, which is nearly if not quite as good as the acre which is represented being cultivated with equal expence of manure and labour, finished planting all my corn prior to the tenth of May, to which cause I attribute solely the success which I have in the crop over former years, having been at less than half the expence in hoeing than when I planted in rows for the three last years, and having nor using any greater quantity of manure in neither of which years did not finish planting corn until the last week in May, it being commonly said it would not do before the season was so far advanced as not to be liable to cold storm; by the first of July I had finished hoeing corn three times rather slightly, not making much hills nor ploughing among it but little, cut no suckers although very many, except a few hills which appeared not any better for it, on the 27th of September I harvested forty hills (which I expected would make the hundreth part of the number of hills con-

tained in an acre, which when measured produced four thousand and eighty hills) in different places the first ten hills there was nine quarts, second ten hills twelve quarts, third ten hills ten quarts, fourth ten hills nine quarts, making in the whole forty quarts, which I spread thin for drying, on the twenty-third of October again measured the same and found only thirty quarts. I then examined the corn in the field and harvested ten hills adjoining the second ten hills, where there was twelve quarts and there obtained nine and a half quarts. On the twenty-seventh of October the whole was harvested and measured one hundred and two bushels and seventeen quarts according to the certificate produced, to which adding twenty-eight pound and three quarters of corn, which was overlooked and found in cutting and carrying off the bottom stalks, would increase it to one hundred and two bushels and thirty quarts. If the whole had been harvested on the twenty-seventh September; at which time forty hills produced forty quarts, there being four thousand and eighty hills to the acre, the ratio must have then exceeded one hundred and twenty-seven bushels with as much certainty as when on the twenty-seventh of October—by reducing that estimation one fifth part (being the quantity shrunk by standing in the field, as appeared in the harvesting the ten hills and obtaining nine and a half quarts adjoining the ten hills which produced twelve quarts) gave one hundred and two bushels, the quantity found in harvesting; the expenses of cultivating have not been kept, not contemplating exhibiting it for premium till about harvest time, but was at no additional expence in cultivating from what is usual and generally done except one additional ploughing and harrowing; the value of the whole labour and manure used I could not have obtained here more for it than twenty-five dollars to the acre. The cultivation of the land prior to the ploughing in 1821, was in being sown with herds grass and clover seed in the spring of 1812, and continued mowing without the use of any manure every season afterwards, until plough-

ed up in 1821, at which time the crop of hay had become very light. The soil a black loam.

FITCH WINCHESTER.

*Southboro', Nov. 25, 1823.*

The above remarks respecting the quantity of corn supposed to be on the twenty-seventh September, I should not have made, had I not afterwards noticed (on the twenty-fourth of October, by looking at the Committee's report in a newspaper) that the premium awarded last year was for corn harvested on the twenty-seventh September, although it so happened on the same day of this year that I harvested the forty-hills, it was solely for the purpose of ascertaining whether the probable quantity was such as would give me encouragement to enter it for premium, in view of which had I before known it and harvested on that day and produced evidence of there being one hundred and twenty-seven bushels which I have no doubt of, another claimant harvesting on the same day should exhibit one hundred and twenty-five bushels of exactly equal weight to the bushel, it would not then be certain which of the two would be entitled to the premium for raising the quantity of sound merchantable corn, unless a bushel (or some quantity) of each corn is shelled on the same day in which they were harvested and measured, and kept until they both become perfectly dry so as to ascertain the exact shrink of each.



*Newton, 28th November, 1823.*

#### INDIAN CORN.

[To the Trustees of the Massachusetts Agricultural Society.]

**I** HAVE the present year, caused the Indian corn, gathered from an acre and twenty-five rods of my corn field, to be

measured, and it produced two hundred and twenty-six bushels of ears. A part of it only has been shelled, and two bushels of ears produced a little more than a bushel of shelled corn.

In July 1822, the land was mowed, and yielded about a ton of hay to the acre.

Early in September of the same year, it was ploughed. It remained in this situation, until April 1823, when it was harrowed. A few days after harrowing, it was ploughed across the furrows about two inches deeper than the first ploughing in September, when it was first broke up. After remaining in this situation a week, it was harrowed thoroughly, until the principal part of the sods were displaced and pulverized. About the middle of May, it was furrowed with a horse plough, the furrows three and a half feet apart, for planting. It was planted about the 20th of May, in hills, three feet and a half apart one way, and one foot and a half the other way.

About eight cords of compost manure were put on this acre, and twenty-five rods. It was composed of barn yard manure, made in the summer of 1822, hog dung, and the clearing of ditches, in equal quantities. This part of the manure was carted into the field, and mixed in the autumn of 1822. In April 1823, it was shovelled over, and six casks of unslacked lime was equally mixed, and covered in the heaps, which contained about forty cords. After lying about two weeks in this situation, it was again shovelled over, and the lime was found to be slacked and pulverized, and the whole heap had become a fine body of compost manure. Every part appeared to be entirely dissolved and pulverized.

The corn was planted about the 20th of May, and as I before observed, about eight cords of manure taken from the before described heap were carted on this acre and twenty-five rods. A common shovel full was put to each hill in the furrows which had been ploughed eighteen inches apart.



The corn was then planted four kernels in a hill, five inches apart. It was ploughed with an horse plough twice, and twice hoed. After the second hoeing, the ground was left nearly level.

This acre and twenty-five rods was measured from a field of about six acres, the greatest part of which was planted in the manner here described, which I consider, from several years experience, the best mode of planting Indian corn. On the remaining part of this field the residue of the heap of manure was carted, in about equal quantities to the acre, with the acre and twenty-five rods. Some part of the field was planted in hills three and an half feet apart each way, and some part in rows three and a half feet apart. The part first described yielded the greatest quantity of corn, although the quality of the land, and the quantity and quality of the manure, were the same.

It was my intention to have ploughed and hoed the whole field a third time, but the corn had become so large, and spread to such a degree, that a horse could not travel through it without injury. There was however scarcely a weed or a spire of grass in the whole field. That part planted in rows yielded more, than that planted in hills, three and an half feet each way, but not so much as that planted in the manner first described.

No more attention was paid to the acre and twenty five rods, than to the other part of the field, and it was not done under any expectation of obtaining the society's premium for the largest quantity, or the best mode of cultivating this article. If however it merits any distinction, I shall be happy.

With great respect, I am your most obedient servant,

WM. HULL.

*Newton, 29th November, 1823.*

This may certify that I assisted in gathering and measuring the Indian corn which was raised on an acre and twen-

ty-five rods of land belonging to William Hull, Esq. of Newton, and it amounted to two hundred and twenty-six bushels of ears.

And I likewise certify that I have assisted in shelling and measuring some part of the corn, since, and two bushels of ears have produced a bushel and half a pint of shelled corn. I likewise assisted in planting, cultivating, and in preparing the manure for the said field, and do certify that the statement made by William Hull, Esq. is correct and true.

BENJAMIN LEE.

COMMONWEALTH OF MASSACHUSETTS.

Middlesex, ss.

*December 1st, 1823.*

Personally appeared Benjamin Lee, the subscriber, and made oath that the same was just and true, before me,

DANIEL JACKSON, *Justice Peace.*

*Newton, 28th November, 1823.*

This may certify, that I have measured a piece of land on the farm of William Hull, Esq. of Newton, on which Indian corn was raised the present year, and it contained one acre and twenty-five rods.

INCREASE S. DAVIS.

COMMONWEALTH OF MASSACHUSETTS.

Middlesex, ss.

*December 2, 1823.*

Personally appeared, Mr. Increase S. Davis, and affirmed that the certificate by him subscribed was true, before me,

DANIEL JACKSON, *Justice Peace.*

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*Newbury, Nov. 15, 1823.*

[To the Committee on Indian Corn.]

GENTLEMEN,

THE following is a statement of the cultivation and production of an acre of Indian corn raised by the subscriber in Byfield the present year. The soil is a dark loam and very fertile, perfectly free from stones, and quite level. In 1822

it was planted with corn and produced equal to one hundred and eighteen bushels. In April, 1823, there was about seven exact loads of barnyard manure spread upon the acre and ploughed in. The first of May it was again ploughed and holed three and a half feet apart, and eight loads of compost manure from the hog-yard were put into the holes. The depth of ploughing both times was about six inches: five grains of corn were placed in each hill on the manure and covered with a hoe. The corn was of the eight rowed kind, and weighed when gathered fifty-nine and a half pounds to the bushel. It was hoed three different times, the plough was used the first and second time hoeing; the third time the hoe only was used. It may be proper here to observe, that at the second hoeing the number of stalks in each hill was reduced to four, and in consequence of some high winds it was observed at the time of topping the stalks, that the average number of stalks remaining would not exceed three and a half. The stalks were topped about the middle of September, and I consider the value to be equal to two tons of English hay. It was harvested the middle of October, and there were one hundred and ninety-nine bushels of ears, which made by estimation one hundred and thirteen and a half bushels of shelled corn. The expense of cultivation, estimating labour at seventy cents per day, will be as follows, viz. :

	15 loads manure at \$1 per load	\$15 00
April 28,	Ploughing	1 40
May 6,	Cross ploughing	1 40
" 8,	Putting manure into holes and planting	2 10
June 3,	Hoeing first time	1 00
" 12,	Hoeing second time	1 00
" 20,	Hoeing third time	70
July 10,	Destroying weeds	35
Sept. 9,	Topping stalks	2 10
Oct. 14 and 15,	Harvesting, measuring, &c.	5 60

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\$30 65

Yours respectfully,

JOHN LEES.

*Newbury, Nov. 26, 1823.*

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

THE following is a statement of the cultivation and production of a lot of Indian corn raised by the subscriber in Newbury. The soil as to quality is similar over the lot, of a clay loam, and had been mowed three years. In November, 1822, there was drawn on to one half of the lot twelve ox cart loads of yard manure, spread on the grass stubble, and then ploughed; the other part was not ploughed until May, 1823. The part that was ploughed in the fall was then cross ploughed, then harrowed; the whole lot which contained about two acres was then holed about three and a half feet apart. There was ten cord of compost manure put in the holes on the whole lot, and was planted between the 15th and 25th of May, with five grains in each hole on the manure and covered with a hoe; the corn was the eight rowed yellow kind, selected the fall before from the most fruitful stalks. It was hoed four times: the stalks were topped about the 20th of September. The suckers were taken out at the same time. About the 20th of October there was one acre staked off by a surveyor, which acre was gathered, husked and measured; and there was two hundred and thirty bushels of ears, and a fraction over. Six bushels of ears were shelled, and it produced three bushels of shelled corn, from which there was one hundred and fifteen bushels and one quart of sound corn from one acre of land. The other part of the lot which was not ploughed till spring and no manure ploughed in, but managed otherwise alike, was gathered soon after the other, and produced about one hundred bushels to the acre. The labour of cultivating and harvesting the above crop was about twenty days work to the acre. The part that was ploughed in the fall and cross ploughed in the

spring worked as much lighter through the summer as to repay the extra ploughing. The weight of the corn was fifty-eight pounds to the bushel. The stalk and stover we estimate equal to one ton and a half of upland hay from one acre. Your respectful servants,

TRISTRAM LITTLE.  
HENRY LITTLE.

This may certify that I assisted in cultivating and harvesting and measuring the above crop of corn, and I believe the statement to be correct. JOHN SMITH.

This may certify that I measured and staked off one acre of land on which corn was growing, for Tristram Little, which contained one acre and no more, to the best of my skill and judgment. SILAS MOODY.

Essex, ss.

*Newbury, Nov. 26, 1823.*

Personally appeared, Tristram Little and Henry Little, and Silas Moody, Esq. and John Smith, and severally made oath that the above communications by them respectively signed, contain the truth. Before me,

EBEN'R. MARCH, *Justice of the Peace.*

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*Newbury, Nov. 25, 1823.*

[To Benjamin Guild, Esq. Assistant Secretary to the Massachusetts Agricultural Society.]

SIR,

THE production of an acre of land cultivated with English Turnips, by Joseph Little on the farm owned by him and his father Silas Little, Esq. in Newbury, is here offered for premium. The soil is a clay loam, and had laid to grass for several years. The 29th of June, 1823, I took off the grass and it made short of a ton of hay. Ploughed the ground

the 1st day of July, and harrowed and hauled on about thirty cart loads of compost manure, which I put into furrows made three feet apart on the second and third day, and after the manure was covered with a double mould board plough. The seed was sown at different times, viz: from the 3d to the 8th of July, and used one and a half pound of seed, and after seeding, the ridges were rolled with a hand roller. When the turnips were up, and out of the way of flies, they were thinned at the distance of more than one foot (which I think injured the crop,) nevertheless I gathered six hundred and thirty-six bushels on the last of October, and I calculate the whole expense of manure and labour did not exceed forty-eight dollars; and that the turnips will bring eighty and the hay ten.

Yours with great respect, JOSEPH LITTLE.

This may certify that I have measured and staked off the above land cultivated with turnips, to the best of my knowledge and judgment, and there is but one acre; and that I did assist in harvesting them, and measured them myself, and there was six hundred and thirty-six bushels.

PIKE NOYES.

I hereby certify that I employed the above named Pike Noyes, to survey, harvest, and measure, the above stated acre of turnips.

JOSEPH LITTLE.

*Newbury, Nov. 27, 1823.*

The forenamed Pike Noyes and Joseph Little personally appeared and made oath to the above certificates. Before me,

SILAS MOODY, *Justice of the Peace.*



*Newton, 24th November, 1823.*

INDIAN CORN.

[To the Trustees of the Massachusetts Agricultural Society.]

THE first week in September last, before there was any frost, and while the corn was in the milk, I cut up about

twenty hills of my corn, and the next day bound the stalks with the ears on, in small bundles and stacked them in the field, where the stack remained until the last of October. It was then carried into the barn, and the corn taken from the stalks. The corn was perfectly ripe, and sound, and the stalks sufficiently cured, to be packed in the mow. I send a few ears, taken from the stalks, without selection, for the inspection of your honourable board. A belief, that a knowledge of this fact, may under some circumstances, be useful to the agricultural interest, has induced me to make the communication. It is not uncommon to have our corn fields injured ; and sometimes destroyed by early frosts in the autumn. To guard against this calamity, must be a desirable object.

In addition to the preservation of the corn, there are other advantages, which may be derived from the practice. The earlier the stalks are cut, the more valuable they are. In this instance, the bottom parts were nearly as good as the tops. All the leaves were retained, and although sufficiently cured, did not crumble in any degree. There may be another advantage in removing the corn from the ground where it grows at so early a season.

It seems now to be a settled opinion,\* that there is no season so favourable for sowing grass seed as the early part of September. In cultivating the corn, the ground, having been frequently ploughed and hoed during the summer, is in the best preparation for this important object. If the corn stands to ripen on the ground, where it was planted, it is too late in the season for the purpose. The ground, consequently, cannot be laid down to grass, until the next spring, and one year's crop of hay is lost. This experiment has been made on a very small scale, and although it has succeeded far beyond my expectations, yet I would not recommend the practice, excepting on a similar scale, until further experiments are made.

\* We do not consider this as a settled opinion. EDITORS.

If however I had a field of corn, late in its growth, and there was a prospect of its being injured by frost, I should not hesitate to adopt the practice.

I have reason to believe, that in the event of an early, and unexpected frost, while the corn is in the milk, there is no mode so effectual for its preservation as to cut it up immediately after the frost, and stack it in the manner I have mentioned.

With much respect, I am your most obedient servant,

WM. HULL.

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*Roxbury, 16th December, 1823.*

INDIAN CORN.

[To the Corresponding Secretary of the Massachusetts Agricultural Society.]

DEAR SIR,

AMONG the papers read to the trustees on Saturday last, I observed one from General Hull, on an experiment made by him the past season in cutting a few hills of Indian corn, by the ground in September and stacking it, which by the sample exhibited was well ripened, he appears to think it a new mode of treatment. I at the same time mentioned the same thing being done at a merino sheep farm of mine on an island in the Winnipiseoga Lake in New Hampshire, on about six acres of corn, the subject appearing to be new to the trustees, some of them thought it would be well to add a note to the general's communication in confirmation; with which I now with pleasure comply.

About the 8th of September last I was at the Island, on one part of which, was five or six acres of corn in three or four different patches, (this Island of near five hundred acres is in almost two equal parts divided in the centre by a neck of only eight or ten rods wide, one part is intended for mowing



and cultivation, the other for pasture, so as to require as few fences as possible) the season had been uncommonly dry and the pastures generally very short, it was proposed to me by several good farmers, as a common method in that part of the country, to cut the corn near to the ground and put it in small stacks near the barn, and place a temporary fence round them, by which means my sheep could have the range of the whole island; I was pleased with the thing and it was done before the 12th of September, the farmers in the neighbourhood were generally topping their corn therefore it was considerably dry.

I was at the island again about the 20th of November, and found the corn in cribs, and in very fine order, much superior to mine at Roxbury, which was not harvested till about the 10th of November, all the stocks, butts and leaves are excellent fodder, when by our usual mode the butts are of very little value.

I think considerable labour is saved by adopting this method although a little more handling in the husking will be required, which however is much more than repaid by the better quality of the fodder; and more particularly, as it will give twice to lay down the ground with winter grain, or grass seed only, at a season too, when it is now becoming generally considered the best time for sowing them. In four or five instances on my farm, within ten years, I have sown grass seeds in the autumn without grain, and even as late in one year as 24th of December, and am decidedly of opinion that the grass takes better, gets better hold and is more lasting than if sown in spring, with barley or other grain, which being cut in the hottest season, leaves the young tender grass too suddenly exposed and is often burnt up.

Since the meeting of Saturday, I have looked into the *American Farmer*, third and fourth Volumes, and find several valuable pieces on the subject of cutting corn early and

stacking it, in Maryland and Virginia ; where it appears to be of great importance, in their mode of culture, by giving time to plough and sow their fall wheat in good season, there are however some writers who oppose it ; but on the whole I think the plan excellent, but care should be taken not to do it too early ; I should think it perfectly safe, at the time we usually top it ; and should recommend the stacks being small, not much larger than the *top stocks* are usually made, to give a better chance for air to pass freely, that it may more speedily be fit to house ; in Virginia they put the corn of two hundred fifty to four hundred hills in a stack, which I should be apprehensive would not answer so well in our climate.

I hope Gen. Hull's hint will be improved upon, the next season, and the result reported to the Society.

I am, dear sir, very respectfully yours,  
JOHN PRINCE.

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WHEAT.

*Byfield, September 1st, 1823.*

[To the Trustees of the Massachusetts Agricultural Society.]

**T**HIS may certify that I the subscriber of the town of Newbury, was employed by Mr. Benjamin Savory of Newbury, parish of Byfield to thresh out a quantity of wheat raised by said Savory and clean and measure the same. I was assisted in the work by Rufus Pray, and after cleaning the wheat by passing it through the winnowing mill it measured fifty bushels of clean wheat, over and beside one half bushel of the wheat unhulled or the tailings, so called. The above wheat was all that was raised by said Savory the present year, was red spring wheat and as I was informed was the Gilman wheat. I have also attended and saw one bushel

of the above wheat measured and carefully weighed and the weight was fifty-seven pounds and a quarter.

DAVID CLIFFORD.

*Byfield, Sept. 1, 1823.*

I the subscriber assisted Mr. David Clifford in threshing, cleaning and measuring the wheat raised by Mr. Benjamin Savory in Newbury, parish of Byfield, county of Essex, and it measured when well cleaned, fifty bushels, beside one half bushel of the tailing so called. I also saw one bushel of the above wheat measured and it weighed fifty-seven pounds and one quarter. I also certify that I have worked with said Savory for the year past, assisted in preparing the ground and sowing the wheat and the above is all that was raised on the farm the present season and was in one lot or patch.

RUFUS PRAY.

*Byfield, November 9th, 1823.*

I the subscriber of Newbury, county of Essex, and parish of Byfield do hereby certify that I sowed a piece of wheat in April last, and the ground was cultivated the year previous in manner following, viz. it was broke up in the fall of 1821; in the spring of 1822, it was ploughed, well harrowed and planted with potatoes and a large shovel full of manure put in each hill, it yielded a good crop, and in the fall of 1822, after the crop was taken off it was ploughed twice, then harrowed fine and laid in high ridges through the winter, in the spring of 1823, before the frost was entirely out, the ridges were split by ploughing, then cross ploughed very deep, quite to the plough beam, and well harrowed, after which thirty cart loads of good stable and hog manure was spread on the ground and ploughed in deep, it was then well harrowed and four bushels and three quarters of well washed wheat which had been soaked four days in a strong pickle, sowed broad cast, ploughed in with a small

seed plough, bush harrowed and rolled with a heavy land roller, it came up well, and grew well through the season, and hardly a single blade blighted, smutty or rusty could be found in the piece, when threshed and cleaned it measured fifty bushels of well cleaned sound wheat, and there remained one heaped half bushel of wheat not hulled, the tailings so called, it weighed fifty-seven and one quarter pounds per bushel, and a sample accompanies the certificates, the soil was a deep yellow loam on a hard pan mixed with clay.

BENJ. SAVORY.

Essex, ss.

*November 17th, 1823.*

Personally appeared David Clifford and Rufus Pray, and made solemn oath to the foregoing statement which they have each of them subscribed respecting the wheat raised by Mr. Benjamin Savory of Byfield parish, town of Newbury.

I would also state that the above named persons, I have known them for a number of years. I think them steady, well behaved men and entitled to credit it.

DANIEL HALE, *Justice Peace.*

*November 17th, 1823.*

This day surveyed for Mr. Benjamin Savory, the land where the aforementioned wheat grew which contained one acre and one hundred and forty-six rods.

JOHN NORTHEND.

Essex, ss.

*November 17th, 1823.*

Personally appeared the above named John Northend, and made solemn oath to the statement above made by him, respecting the measurement of the land on which Mr. Savory's wheat grew, before me,

DANIEL HALE, *Justice Peace.*

Essex, ss.

*November 18th, 1823.*

Personally appeared, Benjamin Savory, above named and

made solemn oath, that his statement, respecting ploughing the ground, sowing and raising the above mentioned wheat, is a correct statement, before me,

DANIEL HALE, *Justice Peace.*

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CASHMERE GOATS.

[To the President of the Agricultural Society.]

A MEMOIR of Messrs. Ternaux and Jaubert, read before the Royal Academy of Sciences at Paris having been sent me, I deemed the subject of which it treated would be interesting to the public, and handed an extract therefrom, with some introductory observations, to the editor of the New-England Farmer, which was published January 11th last, in that useful paper.

This subject, so interesting to naturalists, and destined to become important in the progress of our manufactures, arrested the attention of the Trustees of the Agricultural Society of Massachusetts. At their last publication of premiums, they offered "the sum of one hundred dollars to the person who should import into this State, from Europe, a male and female goat of the pure Cashmere breed."

They further requested the subscriber to procure, through his friends in France, such an account of this animal as to thrift, mode of treatment, productiveness, &c. as might enable them to form the most correct judgment how far the climate might suit, and general circumstances make its introduction here expedient.

The desired information has been obtained by my friends from Messrs. Ternaux themselves, who state that the animal is naturalized in France and promises the most satisfactory increase, as well as benefit to manufactures.

To this account, it will appear, a practical mode of

treatment with a flock is added as observed in France. The manner of feeding of animals, and division of pasture will vary according to the climate, condition or culture, &c. &c. But experience must be considered as a guide of some utility, especially in the introduction of a new and valuable race.

The prices, it will be perceived, vary from fifteen dollars, to seventy-five dollars, a head. The duty on export is very trifling, say about four cents each.

The patronage which has been exercised in the encouragement given to these meritorious individuals, Messrs. Ternaux and Jaubert, is as honourable to the government of France, as the enterprize and success of the expedition is to those gentlemen. The diffusion of the knowledge acquired and of the benefit of the discovery, of which, it will be seen, all may avail, is of a like honourable character. The liberal communication of information by Messrs. Ternaux, and the offer of facility in the export to this country will probably be used by the Society in the course of the next season, at its own charge and risque with a view to that future improvement of our manufactures to which the Massachusetts Agricultural Society always wish to look with a steady attention.

A few remarks only, that these papers may be well understood, will follow.

Until the issue of this expedition it was unknown what animal gave the material of the Cashmere (or by some called Camel's Hair) Shawl. Of these we see the cheaper kinds, but the most valuable are of incredible cost. This question is now satisfactorily settled by these inquisitive travellers.

The route taken was first to Odessa, which is in Russia, on the coast of the Black Sea, Lon. 30, 45 East, Latitude 46, 30 North, a place containing 40,000 inhabitants; next to Tunganrock or Tanganrok near the Sea of Azof. Then to Astrachan in Asia on the Caspian Sea, Lon. 47, 44 East,

Lat. 46, 18 North. This place is the See of a Bishop, and contains within its walls and environs a population of 70,000. Then passing to the foot of Mount Caucasus, between Astrachan and Oremburg, a wandering tribe were found, who possessed the animals sought after.

To illustrate the good fortune of these travellers, it need only be stated that, if they could, from 1229 goats, reach France with only about 400, their disappointment must have been inevitable had they have proceeded from the Caspian Sea, to Thibet on the borders of India. The journey must have been insupportable, and to no good effect.

I am, sir, very respectfully your's,

JOHN WELLES.

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*Paris, April 8th, 1823.*

*John Welles, Esq.*

DEAR SIR,

I HAD the pleasure to receive your letters requesting me to obtain for you the best possible information respecting the Thibet Goat lately introduced into France.

I have made the necessary application to Messrs. Ternaux who have very politely and readily transmitted to me their opinion upon the importation and naturalization in France, by Messrs. Ternaux & Jaubert of the Thibetian Race.

The animals which were imported as well as those bred here continue, say they, to prosper in the most satisfactory manner, particularly those which inhabit a high and rocky country. In general humidity and rich pasturage are pernicious to them.

To this information Messrs. Ternaux add, that the goats have been sold from eighty francs, (fifteen dollars,) to four hundred francs, (seventy-five dollars,) per head, according to the beauty of the animal, and pays a duty of only three cents per head, upon exportation.

To enter into as many details as possible as to the modes of treating these goats, I will relate to you the manner, a friend of mine who bought ten of Mr. Ternaux two years ago treated his. Some of these goats were those imported, and others were those bred in France.

He had constructed a fold fifteen feet in length, to ten feet in width, with racks all round a bed of straw which is renewed every ten or fifteen days. The fold should be as little confined as possible in order that the air may circulate freely. It suffices that it should be covered with a simple roof, and at a small height, the other parts in lattice work or open. A trough for water. They give them early in the morning a bundle of hay, (say twelve pounds,) and the rest in vegetables and herbs from the kitchen garden. As soon as the dew is passed or the grass dry after rain, they let them out into the field, in a square surrounded with a barrier or portable fence, each barrier from four feet in width to six feet in length, twelve in all, which makes a square of sixty feet. This extent of ground is sufficient for one day's food and sometimes two according as the grass is more or less grown. By the means of these barriers you go over the whole extent of ground and the goats have always fresh pasturage. When they have in this manner gone over the field, you begin again at the first place, avoiding only to return too soon before the grass may have well grown, otherwise they will not eat. At the setting of the sun they are taken back to the fold and you give them another bundle of after grass or second crop hay. This last ration is only necessary in winter, when there is not much in the field or greens from the garden. They give them also every evening a peck of oats and bran mixed together, and once a week you add two handfuls of coarse salt. In the most humid season you double the quantity of salt. If you perceive the goats are too heated you give them bran without oats, if the reverse you give them oats and salt without bran. These animals are very docile and



easily led. It is generally in the month of February, and March that the mother has her young after having carried it six months. At the birth of the young goat, you give to the mother a little more oats and bran. It is in the month of April you gather the down otherwise called the Cashmere wool, you take it off in combing the outside hair, you must when you perceive when the down begins to fall in the fold or on the grass, comb them a little every day with a comb that has the teeth very closely set. From five goats my friend gathered nearly two pounds of down last year, they are subject to the same diseases as sheep. Wet or damp ground does not suit them. These diseases manifest themselves by humours and eruptions of the skin and great increase or swelling of the hoofs. These animals eat of every sort of vegetable, they are fond of the twigs of trees, only it is necessary to prevent their eating of pine or fir trees or any evergreen (that is to say, any trees that remain green the year round) these trees are a sort of poison to them.

The down has been made use of in some of our manufactures to a very striking improvement. It will need however some time and experience to realize all the advantages which have been anticipated. If I can hereafter, in this, or any other subject connected with the laudable purposes of the society with which you are connected, render any services you will freely command.

As the writer is not an agriculturist I do not feel at liberty to use my friend's name.

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Extract from a Memoir read before the Royal Academy of Sciences.

#### THE CASHMERE GOAT AND ITS IMPORTATION INTO FRANCE.

THE sight of these shawls, which are brought from Asia, and which spread all over Europe, make a part in the presents of the sovereigns of the east, and adorn the heads and waists of the rich inhabitants of those countries, gave rise to the

question among the naturalists of Europe, what species of animal produced the material from which such precious stuffs were made. Travellers gave no satisfactory information upon this subject. The general opinion was, that cashmeres were produced from a goat, but the particular species was not determined. The importation which has just been made, clears up, in part, this difficulty for these animals produce a down exactly like that of which the most rare shawls are made; I say in part, because it is not impossible that wool may be also employed for this purpose, or that different kinds of the goat may unite to bring the manufacture to perfection. I shall describe particularly those which I have seen upon their arrival at two of our Mediterranean ports.

Their usual height is about 25 inches from the ground to the top of the back, and the length from the beginning of the tail to the head, three feet. Almost all have horns, which are straight, black, and for the most part round; those of some males, as well as females, are thick, furry, white in the majority of individuals, some brown or black, several spotted. They are formed of long hairs, which cover the legs, in part, and a very soft down. The latter is fine in proportion as the hair is long; the quality of one may be known from the other. This down grows near the skin, from which it separates and forms tufts, which can be drawn away by a comb or by the hand. Except in the case of an absolute prohibition, it appears as if our manufacturers could have no interest in importing these downy cashmere goats into France, for the material may be procured in the way of commerce; it would be sufficient for them to imitate the stuff which bears this name. M. Ternaux, so well known by his beautiful establishments, was not of this opinion. He had received, by the way of Russia, down enough to make some shawls; his success gave him the idea of procuring the animal on whose body nature had placed this down. The undertaking was not an easy one. He found M. Jaubert, Master of requests, and Professor of the Turkish language, a

man of zeal and intelligence, who was not to be repulsed by obstacles, and who was much attached to this country. This gentleman had already travelled in the Levant, and could make himself understood among the different nations. He was willing to undertake the expedition.

In order to obtain the protection of government, M. Ternaux presented him to the Duke of Richelieu, then Minister of foreign affairs. This Minister, who acknowledged the utility of the project, made a contract with Ternaux and Jaubert, in the name of the king, by which Ternaux was to receive a premium of encouragement if the expedition succeeded. The government was to take a hundred goats at a high price. In consequence of this, Jaubert left Paris in the month of April, 1818, recommended by the Duke of Richelieu to the notice of the Emperor of Russia. This sovereign gave orders in his dominions that the French traveller should be furnished with all the facilities he needed. Jaubert went first to Odessa, Tangarock and Astracan, to the camp of General Jermoloff, under the Caucasus, taking every where information from the Boukars respecting the Kirghiz and the Armenians, who frequent and inhabit the last of the cities. He was informed that there existed among the numerous hordes of Kirghiz (a wandering people who came into Boukaria,) on the borders of Oueal, a species of goats which was almost always of a dazzling whiteness, and which bore every year, in the month of June, a remarkable fleece.—The samples shown him convinced him of the conformity of this down with that which came into France by the way of Russia.

The discovery was more interesting to him, as it saved his time and a troublesome journey in crossing into Thibet, by Persia and Cashmere. He was not deceived, and in some hundred versts from the Wolga, in the middle of the Steppes, which separated Astracan from Oremburgo, he found thick down, which convinced him that he would not find it necessary to go much farther. He also remarked that they gave

them the name of Thibet goats, in the language of the country, when they spoke of them. He then made his purchases, buying different lots among the Kirghiz, of the horde called Cara Agedi (the black tree,) among the Kirghiz of the horde called Kaiskas, in all 1229 beasts. He directed his troop towards Tzaritizin, where he passed the river Wolga. The season became severe, and the mortality among the goats was very great. He had formed a plan of embarking them at Tungarock, but the sea of Azoff was frozen. He was obliged to go along the coast with them to Theodosia or Cassa. He arrived there the 24th of December, after having lost 263 of his animals. The 14th of February he sent, in a Russian vessel, the only one he could procure, 566, together with some Austrian sheep, under the care of a French supercargo. The vessel arrived at Marseilles towards the month of April: Jaubert had preferred not to come until he could bring the second troop, which he did not choose to leave behind.

It results from the experiment of Jaubert and Ternaux, that from 1229 goats bought among the Kirghiz, deducting all the losses which have taken place, there are at present in France 400 downy goats of Cashmere.\*

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#### ON THE DANGER OF DESTROYING FRUIT TREES BY INJUDICIOUS GRAFTING.

THE following letter from John E. Howard, Esq. of East Bridgewater, was accidentally mislaid or it would have received an early insertion in our Journal. The facts stated by Mr. Howard are important, and the inferences drawn from these facts are correct and unquestionably sound. Nothing can be more pernicious, than too extensive pruning, or head-

\* It is possible and even probable, that in the translation of the names from the native countries some errors may have crept in. Nothing is more uncertain than the spelling of proper nouns in foreign countries.

ing down of trees. Some trees bear this unnatural privation of their limbs better than others. This seems to depend on their greater tendency to throw out suckers and small limbs, which speedily supply the place of the old. Generally speaking, the trees which most readily take from cuttings, which appear to have a greater share of the principle of vitality, will endure severe pruning better than those of slower growth. Thus for example—the poplar of all varieties, and the willow, may be fearlessly headed down to mere stumps, and their smallest twigs will take root. But if you should head down a walnut tree, it will nine times in ten die. So will the pines of all sorts. Among fruit trees, the apple is most impatient of the pruning saw. It is given to canker, and the whole tree is often destroyed by an attempt to graft all its limbs at once. In the year 1786, my father, then new in the art of horticulture, employed a common grafter of very little skill, to engraft some old apple trees which bore very indifferent fruit. He cut off every limb, and inserted scions in them all. Nearly one half of these trees perished in the course of ten years. Some died in two years. Others of greater vigour, sustained a miserable and sickly existence for a longer period. Five years since, two apple-trees, which overshadowed an ornamented hedge which I valued more than the fruit, were cut close into the trunk by my directions, they both died the following year, though they had sent out shoots to the length of eight or ten feet.

The pear tree will bear pruning much better than the apple, but I have seen severe pruning for grafting nearly fatal to this tree also. On the whole, there can be no doubt, that the top of a tree or plant is as necessary to its health as its roots—that although some trees will survive rash and sudden amputations at *one* time, as men will sometimes survive amputations of both thighs at once, yet nine times in ten the experiment will fail, and is at all times precarious.

J. LOWELL.

*Roxbury, Nov. 1, 1823.*

Vol. VIII.

*West Bridgwater, November 7, 1823.*

[John Lowell, Esq. Corresponding Sec'y. of Mass. Agricultural Society.]

SIR,

ON the 28th April last, I employed a man in grafting a young orchard, situated on the margin of a river near my residence. The soil is of an excellent quality, and well adapted to the growth and sustentation of fruit trees; and the situation, in other respects, very eligible for the purpose to which it is applied.

Among the number of trees which were then grafted, was one (and there was not in the orchard, previous to this time, as was sufficiently indicated by the broad dark leaf, and the smooth, shining, and almost transparent bark, another in a more healthy and flourishing condition) having only two branches sufficiently large for grafting, and which, being severed from their parent trunk, left it entirely destitute of both leaf and limb: not even a twig or sucker were visible about it. Four handsome scions were inserted in the stocks, and the usual precautions taken to preserve them in their position, and secure them from violence.

After the operation of grafting had been completed, I continued, daily, to visit the orchard, watching, with minute attention, the progress of the sap as it made its way into the new inserted scions. My repeated visits enabled me to make, in course of the season, the following observations.

1st. That the scions set in the trees from which the tops were not entirely taken off in grafting, put forth much sooner, than those in the tree here particularly noticed.

2d. That these last did, at length, put forth, and look thrifty and promising.

3d. That they soon however began to take on a sickly hue, fell into a state of general decay, and before the commencement of the present month, I found both stock and scions entirely dead.

I have since carefully examined the tree below the surface of the ground, to ascertain whether its death was not occasioned by the attack of some destructive insect; but could find nothing to justify such conclusion. The bark still remains whole and entire, without the least appearance of any bruise or incision being made in it. To what then can its premature death be attributed? *to the taking off of the top in the manner, and circumstances, in which this was done in grafting?* If this be the case (and I have scarcely a remaining doubt on the subject) it is a fact certainly of importance; and one of which farmers generally ought to be apprized. I am, sir, very respectfully, your obt. servant.

JOHN E. HOWARD.



ADDRESS OF JONATHAN ROBERTS, Esq. PRESIDENT OF THE  
PENNSYLVANIA AGRICULTURAL SOCIETY.

WE are induced to insert this address in our Journal from a great variety of considerations. We do it on account of its own intrinsic merits. It is plain, simple, perspicuous, in a style adapted to the class of citizens whom it was intended to instruct.

We insert it, because we think that the whole body of American farmers should consider, that their interest is a common one, and too much cannot be done to make known the usages, experience and skill of every part of our country. Besides, it is no disparagement to any other state to say, that when agriculture attracted the attention of the public, and claimed to hold its natural rank among our pursuits, Pennsylvania could fairly lay claim to the first rank among its sister states as an agricultural country. We ought to look to the excellent cultivators of that state for lessons founded on experience, which is the only sure guide in all the arts, and more especially in agriculture.

We would not be understood to express any distinct opinion in favour of any of Mr. Roberts's opinions. There are some, about which we have doubts, but it is proper that the sentiments of a man enjoying the confidence of a society, in a state, where agriculture is so advanced, should be known. The doubtful manner in which Mr. Roberts speaks of root cultivation will not meet the approbation of northern farmers. His remarks on the effects of gypsum or plaster of paris deserve our most serious notice. Pennsylvania has tried this manure longer and more extensively than any other state, and if its virtues are *there* called in question, if it has been found to impoverish the soil, and to require the application of lime to renew its fertilizing qualities, the fact ought not to be concealed.

His suggestion that herds grass, (or timothy as it is called in Pennsylvania) is injurious to the soil ought also to be stated in order that it may elicit inquiry.

His preference of the ox to the horse, for labour, coincides with our New-England notions, and must confirm our previous opinions. On the whole, we think his address will be read with interest and profit. EDITORS.

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#### PRESIDENT ROBERTS'S ADDRESS.

"It is in vain to talk of producing much beyond what the market demands; that for which there is no sale, will hardly be cultivated; many of our products are in little demand, and hardly bear the expense of culture. Can this state of embarrassment be relieved? is a question, the solution of which claims the sober consideration of the wisest heads. Much has been done for commerce and manufactures; but when has the agriculture of the middle states shared any benefit from the national legislation? Yet we have grown to be one of the most considerable agricultural



nations in the world, and *this* portion is not behind in her productions. This great national interest was well content to see commerce cherished as a pursuit that then needed it, and as a most valuable mean of prosperity; commerce then winged our products to every market. To us, then, every market was open. In many markets, we are now forestalled, and this interest in her turn claims regard; it is time to harmonise and consolidate it; it will not seek the aid of bounties and premiums, but it has a right to the home market; it is in the power of the Congress to secure it without oppressing any other interest; the majority of the state and national representatives must ever be elected by those interested in the culture of the soil—their petitions must be secure of attention, and the legislative power, when it is proper, cannot be slow to interpose. Allow me to repeat that it is just, that those articles in which we abound, should be secured the home demand. An accidental rise in the price at home, or depression abroad, cannot make the importation of such articles, a wise policy; we have, and must continue to have, a full supply of grain. Why then offer facilities for its importation? Countries which, perhaps, at no time grow sufficient for their own consumption, have found it necessary to protect the farmer against sudden depressions by importation. So far as consumption is concerned, absolute prohibition would seem the better policy. Wheat and potatoes of foreign growth have sold in our markets at good profits, when the products of our own soil would hardly repay the expense of cultivation. On nothing do prohibitory duties seem so strongly called for, as on the articles of *wool*. By one of those changes in the affairs of nations, which rarely occur, the fine woolled sheep of Spain became transferred to our country;—we all remember at how much expence and some of us, perhaps, have to regret it. Practical men at length, became engaged in the growing of fine wool. This interest was at first checked by the large importation of woollen goods, immediately after the late peace

with Great Britain. It had hardly began to revive, when extensive importations of wool paralyzed the hopes of the farmer, and now seriously threaten the annihilation of this precious race of animals. For some time wool, the growth of the country, has not been exchangeable for money; the keeping of merino flocks under the best management is almost a total loss; I speak from actual experience. Prompt and effectual legislative interference is required for the preservation of this interest. No exertion ought to be omitted to secure so important an object. An encouraging bounty has long been secured to the growers of sugar, an article, which perhaps we have no means of cultivating to the extent of the home demand, while wool, an article we can produce to any extent, pays less duty on importation by one half than sugar. The best interests of the country loudly call for increased duties on foreign woollen fabrics, and onerous ones, at least, on the importation of the raw material. In the year 1816, our most successful manufacturers of cotton despaired of producing goods at the India prices;—but in the short space of seven years, what astonishing facilities have been acquired in the cotton business, while the raw material is still at a good price? Our woollen manufacturers are fast following the success of our cottons, and the production of the raw material is little less important to the middle and eastern states, than the growing of cotton and sugar is to those of the south and west. It is not a high price, that is needed to encourage the growth of wool, but a market at which it may be exchanged for money.

Farmers are deeply interested in having the inspection laws so executed, as not to give a preference to the products of other states in our own markets, as well as those abroad. Time has been, when our superfine flour was preferred to that of the neighbouring states; lately, however, that of New York and Richmond, and perhaps Baltimore too, has been in better demand than that of Philadelphia inspection. This inconvenience has not arisen from the

want of good laws, but from a mistaken policy in executing them. It is especially the concern of the producers to keep the standard of inspection as high as that of our neighbours. A bad inspection may easily disparage our products, but it will be always found a difficult task to restore their credit. The raising a degraded inspection will be felt oppressive, and in the natural order of cause and effect, credit once lost cannot be regained until it may have been some time deserved. Almost every man knows the value of credit, both as it relates to men and things, though it may be often less real than fanciful.

The freedom enjoyed by our citizens in the choice of their occupations, forbids us at an early time, to look for large investments in the cultivation of the soil, for the mere object of profit. Centuries are perhaps to pass before our farms will be so expensively wrought, or so minutely divided, as in the best populated countries. Necessity only can press man so closely on man, and that necessity cannot early occur in so extended a territory. An exemption from the inconveniences of a dense population forms not the least valuable item in our rich inheritance. Too much *land*, however, brings inconvenience, as well as too little. Speaking practically, the size of a farm is best regulated by the consideration of what a proprietor can conveniently superintend personally. That description of persons called managers, are rarely to be met with amongst us. Most of those qualified to take charge of other people's business, prefer having it of their own. This fact is a gratifying proof of the freedom and happiness of our people.

The true point of excellence in practical husbandry, is as far as possible to make the farm fertilize itself. Not that it is bad economy to buy manure, but that the *production* of it is the *only* resource for the country at large. The collections from stables, and the streets of cities, are to be had in comparatively few places. In years past, the demand for produce at good prices, and favourable seasons,

gave to farmers a return for their capital and labour that cannot now be looked for. Unproductive seasons have been joined to dull markets for several years. Light crops make lean barn-yards, and impoverished fields follow as a consequence. There is, however, room for an improved economy in the production and collection of manure. Lately a beginning has been made to convert the whole corn plant into a nutritious fodder,\* or most valuable addition to the savings of the barnyard. The advantages resulting from this method, it is to be feared, are too little appreciated. With less labour I have found it the best method of harvesting the crops; it is then cured with less liability to injury from autumnal rains. We may well doubt, whether we have learned the value of this magnificent plant; the crop in one of the most certain, and least exhausting to the soil, while it is one of the most productive, cheaply cultivated, and most useful:—by this crop our sward lands are best decomposed and mellowed. It forms an important item in the course of crops, that must constitute our best husbandry. It may be doubted, if the root cultivation would be held in such high estimation in Great Britain, if this plant could be matured there; here the root culture has been little resorted to as a mean for feeding stock; it is by no means certain, that the American farmer would find advantage in engaging deeply in this course of husbandry; crops of this kind can only be abundant on grounds heavily, and of course, expensively manured; they will generally require more labour than the corn crops; they are not easily secured from frosts in our severe winters, nor can they therefore be fed with perfect convenience. So far, however, as they can be used as food for cows giving milk, they form an excellent admixture with corn meal—but they fall much below the corn crops, in what they add to the savings of the barn-yard.

\* This seems to have reference to the plan of cutting the corn early, as proposed by General Hull, and Mr. Prince. EDITORS.

The potato and the turnip are the only root crops I have had much experience in cultivating; I have found them both uncertain in their product, the former an expensive culture, and the latter of little value when abundant. Neither of them leave the soil in so good a state for a succeeding crop, as the corn plant.

In the course of twenty-five years experience, I have found summer fallowing a bad course of husbandry, even for a wheat crop, before the ravages of the insects made it so precarious a culture. By a course of corn, flax, oats or barley, wheat or rye, and clover, we have avoided fallows, and have been enabled to improve our soil.

Farmers can well recollect how beneficially gypsum or plaster of Paris was exhibited as a manure, and that in the course of eight or ten years after its general application, the clover afforded neither a wholesome summer pasture, nor winter fodder. Recourse was then had to the culture of the fibrous rooted grasses: an evident diminution of the ploughed crops followed. Of these grasses, timothy was found to be the most productive, but the most pernicious to the soil.\* It was recommended by its kindly commixing with clover, but with these qualities, it is in very little estimation at present among experienced farmers. The orchard, ray and herd grasses, appear to be entitled to no preference over the native grasses of our country; they do not afford so rich a sward for the plough. The clover at present seems to have regained its original value. The cause of its deterioration or recovery, I pretend not to explain.

The use of gypsum for a while superseded the use of lime—during that period the soil became saddened and unproductive. A recurrence to its use promises the former results, an open and productive soil. The effect of lime on grass crops in this second trial, has been scarcely less visible and valuable than the effect of plaster when first applied. This precious mineral abounds throughout our conn-

\* This fact, if it be one, is new to us.

try. It forms (limestone) an essential ingredient in restoring and improving the fertility of soils. Our farmers well understand this, and they now apply it to an extent and expense alike creditable to their enterprise and intelligence. But to realize its full benefit, it must be accompanied with moderate dressings from the barn-yard, at periods from seven to nine years. To keep grounds long in grass without plentiful top dressings will be found an unprofitable husbandry. I have experienced it to be advisable to plough the third or fourth year. The extent to be put under the plough, must be proportioned to the resources of the barn-yard or the manures obtainable. Ploughed crops will ever exhaust the soil, and the farmer should be prepared to retain or improve its fertility. Dressings from the barn door are never doubtful in their effects. Disappointment never results from their application. Casualties may mar the crop immediately following: but benefit is sure at last to be realized.

Farms have been made singularly profitable by the cultivation of grass, and their fertility greatly increased. In this middle region, however, grass farms are less likely to multiply than in the interior and remote settlements. Frumentitious crops must remain a leading object with farmers here. A good system of husbandry comprehends a varied cultivation, and the keeping of several kinds of stock. The farm is thus made more productive, less liable to accidental discouragements from unfavourable seasons and other causes, and a succession of employment is kept up through the year, with fewer occasions of pressure or relaxation.

We have been slow to substitute the labour of oxen for that of horses; but the value of the ox as a labouring animal, is becoming every day better understood. With us the habit of keeping large stocks of horses has become inveterate. The horse it is true is a burden-bearing, as well as a draught animal, which the ox is not. In small farms they cannot both be kept, and the horse is justly preferred. This reason will not hold in larger ones. It is not easy for those

who have not witnessed it to conceive how much more cheaply the ox can be kept than the horse. When the former becomes unfit for labour his value is but little diminished. It is not so with the latter; he becomes useless. It should be our care to breed only good horses, diminish their numbers, and substitute oxen for the draught drudgery of the farm. We are too little acquainted with the sagacity and docility of this animal, and how profitably he can be employed. Our prejudices are strong against him. He is considered the emblem of dulness and inactivity. But his degradation is a consequence of our ignorance, inattention and neglect. The ancient Egyptians chose him as an emblem of deity—what an homage to his usefulness! I inherit nothing from my father I value more than the preference he taught me to feel for the employment of the ox; nor can I hope to leave a better inheritance to my children. Experience has convinced me he will perform as much labour as the horse—in heavy plough draft he is greatly preferable. The exhibition of his performances here will give him that estimation he deserves. The driver and himself will not continue to be the object of the worlds dread laugh. He will rank with the farmer as one of his most valuable animals.

In practical husbandry the expense of labour is a cardinal consideration. Since the year 1818, farmers have very sensibly felt that labour has been much dearer than produce. We cannot speedily look for their equalization: a mitigation of this effect may be sought in some degree by improved implements. Those who have used the drag-rake can attest its value in lessening the expense, and facilitating the gathering, of that important article, hay. The revolving rake of Pennock and Pierce, is a most valuable improvement of that useful machine. An ingenious application of animal labour in the cutting of grass, has been effected. Of its practical utility I cannot speak, not having seen the machine in operation. If it can be adapted to common

farm purposes, it would rank the inventor deservedly among the benefactors of his country. Nothing is more wanted than the application of animal labour in the cutting of grain. It is the business on the farm which requires the most expedition, and it is always the most expensive labour. Such an invention can be no easy task, or the ingenuity of our fellow citizens, would, ere this, have effected it. But we have no right to despair, where there is not a physical impossibility. A liberal premium might well be employed to obtain such an object. Manual operations are greatly accelerated by properly constructed utensils. How much has been gained by substituting the steel hay fork, instead of those formerly used. The scythe is improving from year to year, not so with the sickle—thirty years ago it was better than it is now. Of all the utensils on the farm, the plough and the harrow are of primary importance. It is not very obvious that either of them are susceptible of much further improvement. It is desirable to ascertain, and bring into use, in the variety of existing models, those that will perform the requisite operations with the least possible force. This is within the range of our objects. The influence of habit is so strong, that it is difficult to get inventions into use, even when their utility had been demonstrated. How many years elapsed after steam power was applied to propel boats, before it could be brought into general use. He who succeeded in this will be better remembered than the discoverer. The rake drawn by animal power, is yet comparatively in little use. In no way can this society effect more good, than in accumulating and demonstrating, by actual operation, the utility of inventions calculated to facilitate the labours of husbandry and rural employments.

Household industry comprehends an essential interest in rural economy. It is the department in which the influence of that sex, to whom we are bound by the strongest ties of love and gratitude, is most conspicuous—it is the link which connects them with our exhibitions—it is the scene where the thrift, the ingenuity, the taste and intelligence of we



man, has full latitude of operation. How many comforts, how many enjoyments are accumulated? how many endearments are secured, by raising her to her proper elevation? A community will be formed, refined, and happy, in proportion as woman is secure of respect. Employment is ever the shield of innocence, and the nurse of virtue. In a farmer's house it is the best maxim, *to make what you can*, even when foreign commodities are most depressed. Who would not prefer having their spinner, their dyer, their clothier, for their neighbours, rather than in a foreign land? Independently of all interested considerations, we must delight to cultivate an interchange of kindnesses and mutual good offices. How much must life languish where they are wanted? Our young people, who do not inherit farms, may in these pursuits commence life as heads of families, and end it as cultivators of the soil. But there are seasons in which the farmer needs their assistance in his business. They will be found ever ready to lend it. Agriculture must languish where it cannot, at intervals, bring tradesmen to aid in its labours. It is not in relation to the comforts of families only, that household manufactures deserve high regard and consideration: they are of essential importance to national prosperity. The community whose time is the most carefully and usefully employed, will be the most flourishing. Where there is no household manufactures, much time will be consumed to little purpose, and much expense must accrue to purchase that which is not produced. The wealth sent abroad for foreign conveniences, as things now are, will slowly, perhaps not at all return. Thus the nation will become impoverished. National penury must militate against individual and domestic happiness. It is a point of sound policy, to nourish a taste for household manufactures—it is for the ladies to facilitate and effect their establishment. Teach them it is for their country's good, and they will do their duty. They will not be slow to learn, when their fathers, their husbands, their lovers, become their teachers.

## HON. MR. WELLES ON GRASSES.

[To the Trustees of the Massachusetts Agricultural Society.]

IN the Agricultural Journal of January last I offered some observations on Grasses, and gave the result of an experiment shewing their loss by exsiccation or the process of drying, in the summer of 1822. This subject has been pursued during the past season, and still farther extended. The variation, in the comparison of the two years, is not, it is apprehended, greater, (except in one or two instances which will be explained) than will often occur from the nature of the soil, difference of season, closeness of vegetation, exposure to the sun, &c. &c. As far as a general principle may be established by experiment, it will, in some degree, go to fix the relative value of our natural grasses, as they prevail in our pastures, or of those artificial grasses which should be selected as fit objects of cultivation. In collecting these several species, I have found the natural grasses which generally prevail in this neighbourhood, so few in number, that a short and yet sufficient description of them could be most properly first given with advantage.

The earliest grass we have is the *Avena Spicata* (Linn.) or spiked oat grass. It is peculiarly indigenous to the United States, and grows, it is said, as far south as Georgia. This grass ripens so early that it mostly sheds its seed, and thus reproduces itself, and is widely propagated. For this reason, as well as from its short growth, it is undeserving of culture, yielding little to the scythe. But it is of great value for early feed in our natural pastures, in which it abounds. One hundred pounds cut on the 15th July last, gave fifty pounds of hay.

The next grass which we shall mention is the *Poa pratensis* (Linn.) with us falsely called Red top, a colour it never has. This, both in Europe and America, is the common and prevailing grass of the pastures. It grows in almost

every soil and situation, and is one of those materials which is used in Europe for the manufacture of bonnets. The colour of its top, or panicle, is of a yellowish brown. The number of florets in the spike vary from three to five. The seed is sometimes saved and sown; but these fine spired grasses have so minute a seed, that, either from exposure to dampness and fermentation, or some other causes, which it is difficult to prevent or discover, they too often fail of vegetating, by which great injury and disappointment occurs in the wished for crop. Though this grass is amongst those which lose the least in drying, yet, as it presents little to the scythe, it cannot be recommended for culture. It is excellent in our pastures, and comes in naturally as the artificial grasses go out of our mowing lots. Indeed it has a preference with our farmers generally, for horned cattle, over every other grass. One hundred pounds cut July 17, gave forty-six pounds. It was past flowering.

The notice of our prevailing natural grasses might here be closed, but as the grasses which we shall next describe appear in our pastures, as well as our cultivated grass land, and are mentioned by several writers in answer to the question proposed by the Society, as to "what natural grasses prevail in this part of the country," we shall give their description here.

The grass here called Rhode Island, is the *Agrostis alba* (Linnæus) the *Marsh Bent* grass of England, or the *Agrostis Stolinifera*, Schrader, German. That excellent botanist, Mr. Nuttall of Cambridge, to whom I exhibited a sample, pronounces it the famous Fiorin grass of Dr. Richardson and the Irish agriculturists, on the authority of Hooker, who describes "the panicle thereof as purple, and the branchlets patent." The colour, at first, of the branchlets is of a deep red, and they adhere closely to the spike, but as they flower they become patent and change to a lighter purple. This grass has six to eight branchlets, and flowers more fully than the *Poa pratensis* though often confounded therewith. It is

amongst those which lose least by evaporation, and would be a more favourable object of cultivation were it not liable to the same uncertainty as to its vegetating and producing a crop as the preceding grass, and, from probably a like cause. In Ireland it is said to suit a wet soil, and to produce over six tons to the acre. In this country it does not flourish in such soil, nor does it give a great crop, especially compared with the Herds-grass. Still the hay is very excellent, and perhaps not exceeded by any other for its intrinsic value in nutriment. One hundred pounds in early flower, cut July 17th gave forty pounds.

The grass, in the answer given to the Society called Cambridge, Dog and Garden grass, is the *Triticum repens*. Dr. Elliot calls it the "hurtful *blue* or *Dutch* grass." In England it is called couch, knot, or dog grass. Every joint of its root produces a new plant, and it is said to be there, as it is found here, one of the worst weeds, and most difficult to extirpate. It resembles wheat, of which it is a species. The best mode to destroy it is to keep the lands longer under the plough, with a frequent use of the hoe, as where this is not done, two years ploughing only not merely multiplies, but occasions it to engross the whole soil. It has a hard woody fibre and is disliked by cattle. It flourishes mostly near cowyards, and gardens, and is called Cambridge from its abounding on the salt banks of the Charles river. One hundred pounds cut July 22d, in late flower, gave forty-eight pounds.

The grasses above described are those which prevail in our uplands, and are indigenous here. They are, probably, most of them what Doctor Elliot, in his *Field Husbandry*, denominates English Spear grass, and speaks of as natural to the soil and more hardy. The term *English* has been applied to our upland hay ever since the settlement of the country. These, with the red and white clover, and the varieties which nature, in a course of culture, or otherwise, produces, are what give verdure and fertility to the face of the earth.

Of the cultivated grasses, the first in importance is the Herds or Timothy grass, *phleum pratense* (Linnaeus). Doctor Elliot says "it is a native and early discovered in this country by a man of the name of Heard in Piscataqua." It is doubtless admirably suited to our soil and climate, and not only flourishes in uplands, but may be sowed to advantage in low grounds, especially when drained or raised with gravel or loam. It often attains in height five feet and has been known to produce over four tons to the acre. It does not yield much till the second and third years. For which reason it is sown with clover, which being biennial and of shorter duration gives it space to succeed. In this vicinity such is the preference given to it, that it sells at about one fourth more than any other hay. It lasts with one or two top dressings six to seven years. The answers to the enquiries of the Society as to the quantity of seed sown, are two to six quarts. There should not be less seed than half a bushel to an acre, which later experience establishes most decidedly. One hundred pounds cut July last gave thirty-nine.

Red clover (*trifolium pratense*) is a most valuable grass, when cut green, it affords an excellent nourishment for cattle in the soiling process, as well as for swine. When made into hay, cattle are exceedingly fond of it. The flower and leaves are apt to separate from the stem, for which reason great care should be taken that it is not made brittle by too much exposure to the sun. It is best cured as far as may be in cock, and should be carted after the dew begins to fall. When properly dried, salt is used advantageously, as it may be housed with safety, more green than any other hay. This prevents fermentation and heating, and it is kept in better order. Many in this vicinity not only salt their clover, but all other hay. Lord Somerville observes that "he uses half a bushel of salt to a ton, and its benefit surpasses all belief producing the best possible effect in colour, flavour, and general result;" with damaged hay, he says "it is a great restorative."

The benefit of salt in the culture of the soil being now so generally acknowledged and the use of it so necessary for cattle in the interior or remote from the sea coast, it is difficult to assign a reason why its use is not more prevalent. To land highly manured two to four pounds of seed in this neighbourhood is used. But in the interior some apply eight pounds and many more. One hundred pounds cut July 6th, gave twenty-five pounds.

The white clover (*trifolium repens*.) is an abiding grass, sending out roots from every joint and forming a close mat on the ground and is very excellent for pastures. But it is found to afford so little to the scythe as to discourage the culture thereof. One hundred pounds cut June 26th gave twenty-seven pounds.

Of the grasses which grow in our meadows two only have been tried. The fowl meadow which Doctor Elliot supposed to have been brought to Dedham by birds said to be the *poa nemoralis* or marsh meadow grass of England.

It is an excellent grass, and deserving of culture. It is believed however to have extended itself more by its shedding its seed early than by any artificial means. One hundred pounds cut July 23, gave fifty-three pounds.

The common grasses of our wet meadows it is believed, are various kinds of *carex*. This in all its varieties is a poor grass, and where the land can be ditched and made to produce a better growth, the means should be taken. It is a bad economy to flood lands with mere water for a long time to increase a nearly worthless burthen. The effect is to destroy all sweet nutritive tender plants. One hundred pounds cut 23d July, gave forty-four pounds.

The "Marine Fox Tail grass," which is the prevailing grass of our salt marshes we receive from nature without knowing how to aid in its increase. One hundred pounds cut July 18th, gave sixty pounds.

The Black grass (*Juncus Bulbosus*) grows principally where the water is freshened by streams from the uplands.

It is the most valuable salt grass we have and but little inferior to upland grass, we know no means of artificial increase. One hundred pounds, cut July 18th, gave thirty-eight pounds.

We have too far trespassed on the time of the readers to do more than allude to some of those grasses which have been introduced and proved unsuitable for our culture.

The Wild Oat grass (*Avena Elatior*) with the Rye Ray or Durnel grass with which it is said confounded, are often seen in our pastures and meadows, but animals seldom touch them. They have a strong woody fibre and afford little nutriment though well spoken of south of us as well as in Europe.

The Burnet scarcely shews itself for a year and then disappears.

The Succory has been praised by Mr. Arthur Young, that distinguished agriculturist who sent it to General Washington. It has been introduced here, is disliked by cattle, and has become one of the most troublesome intruders in our fields. These with the St. Foin and Lucerne and many others have passed away and seem to have ceased with us to excite expectation. Of the Orchard grass or cocks foot (*Dactylis Glomerata*) the trials I have witnessed do not enable me to speak so decisively as one of the trustees, Mr. Prince does, who approves of it. It may be considered as in a course of experiment.

My desire, Sir, in the preceding, has been to aid in exciting an attention to the best means of culture for our grass lands. The process of sowing grass seeds was far from universal within the recollection of many in this country and is lamentably insufficient now. Its neglect has been complained of even in Europe. It has been contended that nature would furnish according to her own capacity the power of increase in this particular. Thus the soil was to be furnished with the means of promoting vegetation by *labour* and *art*. But here these were to stop and the stimulating pri-

ciples were to evaporate and be wasted and one or two good crops lost in waiting for this slow process.

But the blindness of this doctrine is vanishing before the light and improvement of the present age. We learn from experience that the earth presents to industry and skill her ceaseless efforts, and never pauses but from our neglect.

*Table showing the loss of weight in drying grasses.*

	1822.	1823.
100 pounds of Green white Clover,* gave—	17½	27
100 pounds of Red† Clover, gave	27½	25
100 pounds of Herd's Grass, gave	40	39
100 pounds of Fresh Meadow, gave	38	44
100 pounds of Salt Grass.‡ gave	39	60
100 pounds of 2d. crop or English Rowan, gave	18¾	19
100 pounds of Corn Stalks, gave	25	25
100 pounds of Spiked Oat Grass, gave		50
100 pounds of Red Top, gave		46
100 pounds of Rhode Island, gave		40
100 pounds of Couch Grass, gave		48
100 pounds of Marine Black Grass, gave		38

I am, gentlemen, with high respect, yours

J. WELLES.

\* The White Clover of 1822, was taken in the shade. That of 1823, from a light warm soil exposed to the sun.

† The Red Clover in 1823, was taken in the first year of its product, in close growth and for that reason falls short of 1822.

‡ The Salt Grass of 1822, was I have reason to suppose a second growth which accounts for the difference of the two years.

If enabled, experiments will in these cases be hereafter given, so as to fix the result with sufficient accuracy.

#### ON THE MANAGEMENT OF FRUIT TREES.

As this is the branch of Agriculture least understood in our country, it has seemed to me, that no number of our Jour-



nal should be issued without some hints on that subject. No sensible man would pretend to place it in competition in point of importance, with either the general cultivation of the soil, or the raising of domestic animals of improved breeds. The first object undoubtedly is, to produce the greatest quantity, and the best quality of articles of food for the support of the inferior animals, and of man. The second to improve the races of domestic animals which furnish us food and clothing. But when these have been brought to perfection, and indeed while we are endeavouring to bring them to that state, we ought not to neglect those luxuries which our own country is capable of producing, and which contribute essentially to our enjoyments. So long as we pay some millions of dollars for exotick fruits and productions, for foreign wines, oranges, figs, almonds, raisins, and olives, we ought not to neglect fruits which our own climate will produce and which are invariably preferred to those which we import. I hesitate not to say, that in any dessert on the most sumptuous tables, native apples and pears if of exquisite qualities, are always taken and consumed in preference to the finest exotick fruits. So long as we can place on our tables delicious native grapes, peaches, apricots, nectarines, strawberries, raspberries, apples and pears, the exotick fruits will be only used as ornaments to give splendor to the dessert.

With these views we think it our duty to encourage our own horticulture, and to lay before our readers the remarks of foreign cultivators of greater experience.

The article herein inserted was extracted from a work of Mr. Hayward, and which met the approbation of the Horticultural Society of London. It is one of the latest works on this subject, and is certainly entitled to high respect.

We would simply remark that to those who read it carelessly it may seem to militate with the opinion expressed above in noticing the Communication of Mr. Howard, of Bridge-water, as to the policy of *heading* down trees—but on fur-

ther examination it will be seen to be in entire accordance with it.

The reason why injudicious and extravagant pruning of trees is injurious is, that the roots remain uninjured and calculated for the tree in its full vigour. They will therefore send up a superabundance of sap, which finding no limbs or leaves to receive them overflows, and descends down the bark, is there decomposed, and forms a black mass which we denominate "canker."

But when trees are transplanted, the reverse of this takes place—the roots are exceedingly diminished, and are not sufficient to supply the requisite nourishment to the plant. It is almost incalculable, the quantity and number of minute fibrous roots, which are destroyed in all transplantations.

Hence there is no sort of discordance in these opinions, as to the *propriety* and *necessity* of heading down, or severe pruning in cases of transplantation, and the *danger* of doing it, when the roots *remain entire*. One thought may be suggested, and we believe it to be new, resulting from this discussion, which is, that when you prune or graft a large tree or cut off its principal limbs, it may be useful to diminish its *roots* in nearly the *same proportion*. I am induced to mention this, because the Green and Hot House Gardeners are in the constant practice of diminishing the roots, when they *head* down their plants.

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COMMENTS ON THE GENERAL MODE OF RAISING AND MAN-  
AGING FRUIT TREES OF THE NURSERYMEN.

IN the removal or transplantation of trees, gardeners and nurserymen are generally very careless and inattentive in taking them up, and care not how much the roots are broken or lessened in number, provided they have enough left to keep the tree alive; the consequence is, that although the branches left on may remain alive, there is so great a deficiency of sap, from the loss of roots, that the vessels can-

not be filled the following spring, therefore they contract and become inflexible, and after one or two seasons are incapable of extension; so that when in the course of time the roots are restored, and the sap supplied in the usual quantity, it is, from being restricted in its former course, impelled through the nearest vertical and accommodating buds that offer.

Hence it will be seen, that in almost all trees trained in the common way, the first branches which were trained in, and are the most horizontal, are the smallest and weakest, and in consequence incapable of bringing fruit to perfection; and as these occupy the best part of the wall, the strongest and most luxuriant shoots, by being trained erect, quickly grow out of bounds, and are annually cut away.

Thus the strength of the tree is wasted, and the continued efforts of nature to produce fruit, in proportion to the age and capacity of the roots, is obstructed, instead of being forwarded and assisted.

It is this effect that induced the practice of heading back young trees, on transplanting; and under such circumstances it is certainly a proper and necessary method.

Trees that are not headed back, after the usual mode of transplantation, such, for instance, as half trained and full trained trees from the nurserymen, are found to throw out their strongest shoots immediately about the stem or trunk, and notwithstanding these are removed, this and every other attempt to force the sap into the old branches is vain, its nature will remain the same; and a vigorous head cannot be restored, but by a removal of the old branches.

This shews the impropriety of the present practice of heading back and training trees in the nursery ground.

As it is a general custom for those who plant fruit trees to rely on the nurseryman for the production of their plants, it becomes an object of the greatest importance to enquire, how far their general practice is adapted to public utility. And I feel no hesitation in stating, that this business is com-

ducted upon such imperfect principles, that it is almost impossible to find one plant in twenty that is worth transplanting.

It is obvious, that unless the original plan or foundation be good, a perfect superstructure cannot be raised.

From the deformity and disorder produced in the nursery ground, almost all our gardens and orchards exhibit in their trees a complete contrast to the beautiful simplicity and bountiful produce provided for by Nature.

Before, therefore, any thing like perfection can be attained by the gardener, a reformation must take place in the practice of the nurserymen.

The first operations of the nurseryman I will consider to be the transplanting his stocks for engrafting and budding, and in performing this, his only object is, that they grow and produce some kindly luxuriant branches ; but as to how or where, or in what manner, either these or the roots may grow, he is perfectly indifferent.

Whether the bud or graft produces one or more shoots it matters not, the whole are cut off short, or, as it is termed, headed back the following winter, and such as accidentally produce four or five branches, so placed as to be fastened, to form a flat side, are fixed to stakes or a wall, in the form they are usually trained ; and as if further to insure premature old age, decrepitude, and deformity, they are afterwards several times taken up and transplanted in the same careless manner.

The roots are broken or cut off at random, and generally either diminished more than one-half, or they are doubled back and distorted, and if there be enough left to keep the plant alive, it is thought quite sufficient ; and by these means the appearance of blossoms and fruit being prematurely produced, those stunted and deformed plants are sold as half, or full-trained trees for four times the price of others ; and when sold, they are again taken up, and the roots treated and diminished in the same careless manner.

Miller, Forsyth, Knight, and others, uniformly direct that trees from the nursery ground be cut down, or headed back, to two or three eyes, the next spring after planting; and with such plants as are here described, there cannot be a better mode of treatment, but this is evidently losing time, and wasting its produce.

Whenever the roots of a tree are diminished on transplantation, the supply of sap must be proportionally lessened; for if the branches of a tree, under such circumstances, are left at full length, the sap vessels, for want of a due quantity to distend them, become bark-bound and inflexible; and when the roots are restored, and furnish a luxuriant quantity of sap, this, from being obstructed in its former channels, forms new ones through the buds that offer the most perpendicular position, next the stem or trunk; and although these shoots may be rubbed off, still they form again in the same place, and it will be in vain to attempt supporting the original branches.

A regular head cannot be formed, but by a removal of the entire old one; and frequently the vessels of the trunk itself become so fixed and stubborn in the bark, and particularly in standards, as to force the sap out into luxuriant branches near the root.

It has often been made a question, and a subject for argument, whether it is better to transplant from a rich to a poor soil, or the reverse; but as the transplanting from a rich to a poor soil, even were the roots entire, must cause the bark or sap-vessels to contract, for want of the usual supply of food, and be productive of the same consequences as curtailing the root, the doubt is easily solved.

It may further be remarked, that however diminutive a plant may be from poverty, provided the vessels have always been free from contraction, they will readily expand through all the usual channels, and receive and regularly dispose of every additional supply of sap, however great it may be.

## MR. SEDGWICK'S ADDRESS.

WE have just received the address of Theodore Sedgwick, Esq. of the city of Albany, son of the late Hon. Judge Sedgwick, before the Berkshire Agricultural Society, that nurse of Agricultural Spirit in Massachusetts, whose exertions we have been always ready to applaud. We need not say any thing of Mr. Sedgwick's address, of its spirit and energy, of its sound sense, and of its caustic satire. It must speak for *itself*, and *will* speak very eloquently. It does him and his country honour. It would be read with interest in any country. Our Journal was so full before it reached us that we have room only for the following persuasive and powerful argument in favour of an educated, or reading farming population. We ought not to despair of making our farmers theoretical as well as practical men. We do not believe, that knowledge impairs the capacity for labour, but are firmly convinced that it directs that labour to the most profitable means and results, and we are sure that such application of their powers will make them better citizens of a free state. EDITORS.

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 ADDRESS.

WHAT a miserable creature is a man, without pride and *knowledge*? Those who are agricultural must know, how best to cultivate corn, wheat, potatoes, onions, parsnips, carrots; they must know that the root of a cabbage may be found six feet from the stalk, for then they will know, where the spade and the plough are wanted. They must read the English Farmer's Calendar, the New-England Farmer, and the Massachusetts Agricultural Repository, or other as useful books, they must then put this and that together, and with the aid of their own observation, endeavour to find out the way, to make their lands crumble before the plough, or

in agricultural phrase, putrid with fatness. For this purpose, they must have the books, or some of the best of them ; there is no better investment of money. Knowledge is a capital, that does not waste, neither moth nor rust corrupts it ; it brightens in the using. A man who cannot read, is a poor creature ; he has neither hands, nor eyes, nor ears. that are of any use ; and a man, who can and does not. has but half the use of them. The knowing men are the prosperous men in every community, and that should decide the question with the people, as to the expediency, of pushing knowledge to every possible extent. But knowledge has its price, and must be paid for. If we are to be a great nation, renowned for order, frugality and industry, so that strangers shall inquire, whence comes the extraordinary prosperity of these people, what institutions have they not heretofore known to mankind, whence these discoveries for human happiness, and what are they, we must now in our youth, establish those principles and practices, which are to lead to these results. For this purpose, we must cultivate such a taste among our people, that they shall prefer an agricultural show, to a show of wild beasts ; and when they come to these assemblies, it shall be, to take pride and pleasure in the patriotic men who stand foremost in the exhibition of fine sheep, and horses and cattle, and to carry home some useful knowledge for their own towns and villages. For this purpose, we must so educate our people, as that every man shall have a just sense of his own value and importance as a citizen, with a good coat for a holiday and a Sunday, so that he shall consider it a dishonour to be ignorant, a disgrace to be a pauper, but by the infliction of providence, and an indelible infamy to be a common drunkard. There is no mystery in the causes of the superior respectability of any people. My mature life has been spent in a sister State, I am therefore less exposed to the imputation of local vanity, in stating to you, what I know. that this our native state, is not less respect-

ed than any other, (may I not say with truth more?) for all those admirable institutions, which constitute the glory of a people. But the matter is plain and simple, your people are proud; proud of their clean shirts, and good coats, of their roads, their schools, their colleges and their agricultural fairs—instead of envying the wealth and greatness of their capital, they are proud of that too, and with reason, where a hundred and fifty boys in a *free* school, rich and poor, are pushed on to the highest attainments in all the practical science of life—such as will fit them for business, for real business, for work, for labour. Let us not deceive ourselves by supposing that our systems of education are perfect, while so much yet remains, that is quite practicable. The education that the great mass want, is a knowledge of the arts of life, and I should think, that any man who should prepare a plain and practical treatise upon agriculture and the arts immediately connected with it, for the use of common Schools, would render an invaluable service to the public. Who knows any thing of schools, that does not know, that the time of an intelligent boy, is in a great measure wasted, who spends it upon his arithmetic, his writing copies, his spelling book, his reader's assistant, and his Dwight's geography (for this is about all) for the long period, from three and four years of age, to twelve and fourteen, when he leaves the school? Why should not an agricultural school book be written, as well as books in many other branches of knowledge? All that we can communicate by teaching in any science, is that which is now known, and as much is now rendered certain, in that department of knowledge, as in many others. No, fellow-citizens, we must raise the standard of knowledge and taste, and not remain ignorant, that our agriculture is in almost an infant state, compared with that of many other nations; we deceive ourselves by supposing, that their superiority consists wholly in capital, and the cheapness of labour. Not so, it really does not require capital to put to the plough, half the lands, that



are now in tillage—nor to know, that between one plough and another, there is a difference of between two and six hundred per cent, as to economy of labour; nor for the purpose of adopting, substantially, the admirable contrivances, English and Flemish, for the saving of manure, a saving which would pay all our taxes, state, county, and town. Nor to know, that lands in tillage should be reduced by the plough and the harrow like our gardens by the spade. to a powder, so that many a fine little creeping fibre of the plant, may travel on in company upon the same soft easy road, and when they are tired of the journey, may rest together upon a good bed. It does not require capital to plough a field four and five time instead of twice, 'till there is not a cold, matted, impervious clod left, it is the *work*, the *work*, that is wanted, and not the *afternoon* farmer. It is not capital that in twenty years, has doubled the value of the produce of the fields of this country, which I know to be the opinion of many an intelligent farmer: Nor is it capital, but knowledge, that is necessary, for any man to find out the best possible way of doing in the best and cheapest manner, the thing to be done. It is not your ignorant people that perform any thing, even the most common operation of farming, in the best manner. Their way has always the least contrivance and management in it, takes the longest time, is the coarsest, most slovenly, and wasteful. These ignorant people, are a nuisance upon a place, and no one can tell the distress of mind, that they give to your nice, careful, keen-looking, pains-taking folks. The small fund granted by your legislature in aid of the agricultural societies, really does not impoverish the State, and I trust that the good people, and the *poor* people of this fine State, will not disgrace themselves through envy and littleness of mind by abrogating this law, I say the *poor* people, it is a law for them, it is *their* law. It puts more upon a level in a country like ours, the man who has fifty acres, and him who has two hundred and fifty—your two hundred and fifty acre

farmers, sleep a little longer, eat a little longer and more daintily; they wear finer clothes, and then the children must, as things go now, wear finer clothes than their parents. So that before the end of the race, skill, industry, and perseverance, bring matters pretty much to an equality. We talk of the want of capital, and turn with disgust or incredulity, from the accounts of English farming, as though because they live on an island, are surrounded with damp, have landlords and tenants, and not our fine Sun, cultivate turnips and cabbages, that therefore, we have nothing to do with their agricultural arts. But do they not as we, live upon veal and mutton, beef and pork? Have they not meadow lands and grass lands? Do they not with us, cultivate beans, peas, oats, rye and wheat, and if so, are not their arts worth knowing by us? And does this require capital? It would to be sure, require some money to build a pit for the saving of manure, with brick work in terras mortar, after the manner in Flanders, but it would not take the odds and ends of more than a dozen days, for any common farmer to dig a pit in his yard, to be well clayed at the bottom, and covered at top, so as to be a receptacle, with the aid of proper conductors from his stables, for all that passes from his animals. The making of manure by raking and scraping, and every possible contrivance should be the first law to the farmer. We justify ourselves in our slovenliness and low ideas, by complaining of a want of capital. No, let us not mince the matter, one to another, it is knowledge, pride and neatness, that we want. It really does not require a capital in money to raise a fine cow or horse, always sleek, fat, clean, that shall pass its days rejoicing in life, with gratitude to its master (for we may desire to believe that the poor brute has some such thoughts) no, the half that is wasted, will do that, and then the animal is of double the value. But it does require a stock of shiftlessness, laziness, and hard-heartedness, to bring up a herd of miserable, wretched, half starved, dirty, downcast,

mourning cattle, that seem to deplore their very existence, and are at all times, more fit as food for the wild birds and beasts, than for the use of man. The subject of fruit, is of great importance to a district of country like this, where some of the finest, as the apple, plumb, pear and cherry, will flourish as well as in any other. What is fruit, but one of the first and best gifts of God to man, and where is there a finer sun for ripening some of the most delicious, than we have, for three months in the year? This is a real luxury and refinement, to which every man, who has an acre of land should accustom himself. What cheaper luxury with which to load the hospitable table? Men will have luxuries, and if so, they must pay for them. We go to the Indies, to get the materials of a pudding, when our gardens and fields might furnish us with a much richer and healthier repast. It is the *economy* of fine fruit, that we want. Set a child down to a dish of fine peaches and cream (for the peach may be produced in perfection among us, though it will not live for ever, and what tree will?) or of fine gages, or if you please the horse plumb, as we call it, and he will soon show you what is good, for *he knows*—he will pass by the pudding. Then there is another advantage of the fine fruits, of all the productions of nature, they are the healthiest. If they were common, dysenteries and colics would be less so, and we should be saved from many a doctor's bill, which no body can read or spell, but which every body must pay. In health lies much of the glory and happiness of a man, and can it be supposed, that the Supreme Being does not require from his creature, the greatest possible attention to it, when it gives him a glistening eye, a strong arm, and a body fit for labour. There is another advantage still, in cultivating the fine fruits. It teaches a man something; it teaches him to perform a nice operation, and do it well. It teaches him a lesson of eternal vigilance and industry, and to be up and stirring, when he would otherwise be yawning and sleeping. Then again, if he will know how

to inoculate and engraft, and generally the nature of all the fruits, he must *read*. It is reading and education in those matters that appertain to the arts of life, that our labouring people want. I mean if they will know how to perform these operations, in the best manner. They must read what Mr. Knight has written, or Forsyth, or the American Orchardist, or Cobbett, or something or another, and not pursue the trade of engrafting, as I have known it done in this country. That is, cutting off the whole head of a tree, and filling it with grafts, which exposes it to almost certain death—placing winter fruit upon summer, or the reverse, without a single enquiry, as to the nature of the stock; putting twenty grafts upon one tree, beginning at the bottom and going up with a tier, one upon another, thinking I suppose, that a tree like a horse may carry double. Rely upon it, that if you teach a boy to labour and to read, though it would be contemptible to suppose, that *reading* will enable him to plough, *as by a line*; if the operations have been going on together, if he be not a miserable imbecile, he is the more of a man for it, and in the end, will show you better cows and horses, potatoes, carrots, and wheat, and *more of them*. No, we want the fruits; in our orchards the Pippin, the Spitzenburgh, the Rhode-Island Greening, the Swaar, and other fine apples, and not so much of the miserable trash, which the pigs will turn from. In our gardens, fine cherries, peaches, pears, and plumbs. For all this, we must have the nurseries, and not be compelled to send to Mr. Prince on Long Island, or to Lansingburgh, or to Athens, for our trees, *for we can't afford that*. These would make a fine addition to the agriculture of our country, not much less celebrated, if I am not mistaken, than any other district of country, (unless in the immediate vicinity of the great towns) in any state whatever."

AGRICULTURAL INTELLIGENCE.

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WE are very happy to see, that Agricultural Societies not only continue to multiply, but that generally speaking, they seem to be constantly improving in their shows of cattle and of domestic manufactures. It gives us sensible pleasure to perceive that the addresses, are every year improving in their business-like character. That while they evince on the part of the writers, cultivation of mind and research, they serve to communicate very useful information, and what is more, a taste for reading among the class of society in which this sort of information was not abundant, thirty years since. Farmers have a great share of leisure for reading. It can scarcely be hoped however, that any but the most opulent and intelligent among them will purchase an Agricultural library. Yet almost all could afford to pay five dollars to enroll themselves in the Massachusetts Agricultural Society, which will entitle them to receive for life the Journals of this Society, which are published twice a year. Thus for a payment equal to one dollar per annum for five years, they become entitled to receive a work devoted to their own pursuits during their lives. Who is so poor as not to be able to afford this? Who so indifferent to the honour, and dignity of his own profession as not to be willing to pay one dollar a year for so short a period as five years, to secure to himself and his children such a mass of Agricultural facts?

Grant, if you please, and it ought to be and is granted, that there are many errors, many unfounded theories, many extravagant statements of new experiments. Yet does this destroy the motives for reading and thinking on such subjects? We think not—an erroneous an absurd theory is tried and found to be so, and proved by a sounder man to be absurd, but it elicits or produces investigation, and often a sound theory and sound practice. The only terms of admission to the Massachusetts Agricultural Society, are a

recommendation from some one person of known good character that the person applying is an upright intelligent farmer—and the payment of five dollars to the support of the Journal, for which five times the value is returned, if the member lives to a reasonable age.

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WE rejoice to find by a late able address of the Agricultural Society of Maine, that they are rekindling their zeal, and are fully sensible of the importance of the stimulus and direction to Agricultural effort afforded by public societies. It is impossible that Massachusetts should ever be indifferent to the success of Maine. If the ties of consanguinity, of long political connection could be forgotten—entirely forgotten: Yet there would still remain the great and almost unchangeable natural ties of mutual interest. Massachusetts from various causes must be for a century probably, one of the best customers of Maine—The prosperity of Maine must be highly important to Massachusetts.

WE are pleased to see that they have kept pace with us in the importation of new fruits, and that the valuable varieties of pears sent by Mr. Knight, to the Massachusetts Agricultural Society have been at the same moment imported from another source into Maine. May we always thus proceed hand in hand in the advancement of all the arts which contribute to the wealth or the enjoyment of our respective States.

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WE are now reluctantly obliged to recur to a *less* agreeable subject. We should have been much pleased not to have been compelled to renew the discussion. In August last, the Editors of this work received a "*post paid*" letter from Berkshire, addressed to John Lowell, one of the Editors with a *claim as of right*, that it *should* be inserted in this Journal.

Although we disclaim and deny any such right, it being contrary to the usual conduct of such works, and on grounds

perfectly defensible, because if periodical works devoted to any science or art were considered like newspapers, public property, and that men differing from each other, or from the editors could *fairly* demand an insertion of their controversial writings, there would be an end at once to their usefulness, yet as we know from the hand writing of the author, and other unquestionable internal evidence, that the writer is a distinguished citizen, we feel obliged to notice his remarks. He complains of our having intimated that the *thought of Agricultural Shows* did not originate with the enlightened gentlemen of Berkshire, though we admitted that the Berkshire Society had the unquestioned honour of introducing them here.—The eloquent writer, asks Mr. Lowell *by name*, “In what country have you discovered religious ceremonies intermixed with striking effect in agricultural exhibitions? Where have *you* seen a *committee* of respectable farmers ranging over the entire surface of a country *gratuitously* to inspect and decide on the merits not only of Farms, but of crops offered in competition for premiums? Where have *you* seen executive committees to whom is delegated the power to settle on premiums and execute the leading measures of agricultural societies for an entire year? Where have *you* seen the heart cheering *scene* of prayers and thanksgivings? Where have you seen singing of *appropriate odes* by public choirs of *male and female* singers? The delivery of premiums preceded by an address with certificates of honourable testimony to successful competitors *Ladies and Gentlemen*? In fine, where have you seen *splendid Agricultural processions* terminating with *pastoral balls*?” As the letter requested to be published is addressed to one of the editors, and he is called upon to reply, he does it *freely*. In France and England, before any cattle show was dreamt of in America, he personally saw, and read the proceedings of English and French shows at Smithfield, Bath, Lewes, Caen and Paris, exceeding in splendour any of ours *at present*.—The French excel us on such occasions in speeches, and dancing.

but we believe, that we are the only people who have attempted to combine religion with these public festivals, yet we would cling to the usages of our ancestors in this respect, as zealously as any.

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CATTLE SHOW, EXHIBITION OF MANUFACTURES, PLOUGHING MATCH, AND PUBLIC SALE OF ANIMALS AND MANUFACTURES, AT BRIGHTON, MASSACHUSETTS, ON WEDNESDAY AND THURSDAY, THE 20th AND 21st OF OCTOBER, 1824. TO COMMENCE AT NINE O'CLOCK A.M. ON EACH DAY.

THE Trustees of the Massachusetts Society for the Promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c. at *Brighton*, on *Wednesday* and *Thursday*, the 20th and 21st of *October*, 1824; and they offer the following Premiums:

FOR STOCK.

For the Best Bull, raised in Massachusetts, above one year old,	\$30
For the next best do. do.	20
For the next best do. do.	10
For the best Bull Calf, from 5 to 12 months old,	15
For the next best do. do.	10
For the next best do. do.	5
For the best Cow, not less than three years old,	30
For the next best do. do.	20
For the next best do. do.	15
For the best Heifer, (having had a calf,)	15
For the next best, do. do.	10
For the best Heifer (not having had a calf,)	12



For the next best do. do.	\$10
For the next best do. do.	8
For the next best do. do.	6
For the best Ox, fitted for slaughter, regard to be had to, and a particular statement to be given, of the mode and expense of fattening,	25
For the next best do. do.	20
For the next best do. do.	10
For the best pair of Working Oxen,	25
For the next best do. do.	20
For the next best do. do.	15
For the next best do. do.	12
For the next best do. do.	8
For the best Merino Ram,	15
For the next best do.	10
For the best Merino Ewes, not less than five in number, do.	20
For the next best do. do. do.	10
For the best Boar, not exceeding two years old,	12
For the next best do. do.	8
For the next best do. do.	5
For the best Sow,	12
For the next best do.	8
For the next best do.	5
For the best Pigs, not less than two in number, nor less than four months old, nor more than eight,	10
For the next best do. do.	5

None of the above animals will be entitled to premiums, unless they are *wholly bred* in the State of Massachusetts.

Any of the above Stock, when raised and still owned at the time of the exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

For the best Ram which shall be imported into this State, after this advertisement, and before the 20th day of Oc-

tober next, of the improved Leicester breed of long  
woolled sheep, \$75

or a gold medal of that value, at the option of the  
importer.

For the next best do. do. \$50

For the best Ewe, of the same breed, imported under  
the same terms, and for the like superior qualities, 60

For the next best do. do. 40

The persons claiming these premiums to engage to keep  
the imported animals within the State.

No animal, for which to any owner one premium shall  
have been awarded, shall be considered a subject for any  
future premium of the Society, except it be for an entirely  
distinct premium, and for qualities different from those for  
which the former premium was awarded.

#### FOR GRAIN AND VEGETABLE CROPS.

To the person who shall raise the greatest quantity of  
Indian Corn on an acre, not less than one hundred  
bushels, \$20

To the person who shall raise the greatest quantity of  
Vegetables, grain, peas and beans excepted, for win-  
ter consumption, of the stock on his own farm, and  
not for sale, in proportion to the size of the farm and  
stock kept, having regard to the respective value  
of said vegetables as food, stating the expense of  
raising the same, and the best mode of preserving the  
same through the winter, 30

To the person who shall raise the greatest quantity of  
winter Wheat on an acre, not less than thirty bushels, 20

To the person who shall raise the greatest quantity of  
spring Wheat on an acre, 20

To the person who shall raise the greatest quantity of  
Barley on an acre, not less than forty-five bushels, 20

To the person who shall raise the greatest quantity of  
Rye on an acre, not less than thirty bushels, 20

To the person who shall raise the greatest crop of Mil-

- let on an acre, cut and cured for hay, the claimant giving evidence of the time of sowing, the quantity of seed sown, and the quantity of hay produced, \$20
- To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels, 20
- To the person who shall raise the greatest quantity of common Beets on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels, 20
- To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Turnips on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Onions on an acre, not less than six hundred bushels, 20
- To the person who shall raise the greatest quantity of Cabbages on an acre, not less than twenty-five tons weight, free from earth when weighed, 20
- To the person who shall raise the greatest quantity of dry Peas on an acre, not less than thirty bushels, 20
- To the person who shall raise the greatest quantity of dry Beans on an acre, not less than thirty bushels, 20
- To the person who shall give proof of having produced the largest quantity of dressed Flax, raised on

half an acre, not less than two hundred and fifty pounds, \$20

To entitle himself to either of the Premiums for Grain or Vegetable crops, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium, and must state, in writing, under oath of himself, and one other person, (accompanied by a certificate of the measurement of the land by some sworn surveyor.) the following particulars :

1. The state and quality of the land, in the spring of 1824.
2. The product and general state of cultivation and quantity of manure employed on it the year preceding.
3. The quantity of manure used the present season.
4. The quantity of seed used, and if Potatoes, the sort.
5. The time and manner of sowing, weeding, and harvesting the crop, and the amount of the product, ascertained by actual measurement, after the whole produce for which a premium is claimed, is harvested, and the entire expense of cultivation.
6. In regard to Indian corn. The entire produce of the acre must be weighed at the time of harvesting (both corn and cob) and one bushel of the same unshelled must be again weighed on the 15th day of November, and the weights of the whole and of the one bushel must be returned to the committee. It shall be at the option of the person claiming the premium to shell and measure the entire crop or to weigh the same as above required.

And in relation to all vegetables, except Potatoes, Onions, and common Turnips, the fair average weight of at least twenty bushels must be attested ; and if there be hay scales in the town in which raised, not less than three average cart loads must be weighed.

The claim under this head, together with the evidences of the actual product, must be delivered, free of expense, to Benjamin Guild, Esq. in Boston, Assistant Recording Secretary of this Society, on or before the first day of Decem-

ber next—the Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

## AGRICULTURAL EXPERIMENTS.

- To the person who shall give satisfactory evidence on ‘Soiling Cattle,’ not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated, \$30
- To the person who shall make the experiment of turning in green crops as a manure, on a tract not less than one acre, and prove its utility and cheapness, giving a particular account of the process and its result, 30
- To the person who shall, by actual experiment, prove the best season and modes of laying down lands to grass, whether spring, summer or fall seeding be preferable, and with or without grain on different soils, 30
- To the person who shall prove to the satisfaction of the Trustees, that his mode of rearing, feeding and fattening neat cattle is best, 20
- To the person who shall prove to the satisfaction of the Trustees, the utility and comparative value of the cobs of Indian corn, when used with or without the grain itself, ground or broken, 20

## BUTTER, CHEESE, HONEY, CIDER, CURRANT WINE.

- To the person who shall take up in the season, on his own farm, the greatest quantity of good Honey, and shall at the same time exhibit superior skill in the management of Bees, 10
- For the best Cheese, *not less* than one year old, and not less in quantity than one hundred pounds, 10
- For the next best do. do. 5

For the best Cheese <i>less</i> than one year old,	\$10
For the next best do. do.	5
For the best Butter, not less than fifty pounds,	15
For the next best do. do.	10
For the next best do. do.	7
For the next best do. do.	5
For the greatest quantity of Butter and Cheese, made between the 15th of May, and the 1st of October, from not less than four Cows, the quality of the Butter and Cheese, and the number of Cows to be taken into consideration, and specimens to be exhibited at the Show, of not less than twenty pounds of each, and the mode of feeding, if any thing besides pasture was used,	20
For the best specimen of Cider, not less than one barrel, made in 1823, manufactured by the person who shall exhibit the same, and from apples grown on his own farm,	20
For the second best barrel,	15
[These premiums will be continued in future years. Persons claiming them must state, in writing, their process of making and managing their cider, and the kind of apples used.]	
For the best specimen of Currant Wine, not less than one gallon, exhibited by any person who shall have made not less than 30 gallons in the same season in which that which shall be exhibited was made, (a statement to be given, in writing, of the process of making the same,)	10
For the next best do. do.	5

## FOR INVENTIONS.

To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre,	\$20
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To the person who shall invent the best Machine for pulverizing and grinding Plaster to the fineness of twenty-five bushels per ton, and which shall require no more power than a pair of oxen or horse, to turn out two tons per day, and so portable that it can be removed from one farm to another without inconvenience, 30

To the person who shall produce, at the Show, any other Agricultural Implement, of his own invention, which shall, in the opinion of the Trustees, deserve a reward, a premium not exceeding *twenty dollars*, according to the value of the article exhibited.

In all cases proofs must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer. Persons who have taken out Patents for their inventions, are not thereby excluded from claiming any of the above premiums.

No claimant will be entitled to a premium unless in the opinion of the Committee, the machine or implement presented by him shall be superior to any designed for the same use, which shall have heretofore gained a premium.

#### FOR FOREST, FRUIT TREES AND HEDGES.

For the best plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state, on the first of September, 1824. \$100

For the best plantations of White Ash, Larch and Locust Trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state, on the first of September, 1827. 50

For the best Live Hedge made of either the White or Cockspur Thorn, planted in 1820, not less than one hundred rods, and which shall be in the best thriving state in 1824 50

To the person who shall have planted out on his farm, since the spring of 1815, the greatest number of Apple Trees, not less than one hundred in number, and who shall exhibit to the Trustees, at the Show in 1827, satisfactory evidence of his having managed them with care and skill	50
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## FOR DOMESTIC MANUFACTURES.

To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8 yards wide, exclusive of the list, forty yards in quantity, and dyed in the wool	\$20
For the second best do. do. do.	15
For the best superfine Cassimere, not less than 3-4 yard wide, or less than forty yards in quantity	12
For the second best do. do. do.	8
For the best superfine Sattinet. 3-4 yard wide, not less than 50 yards	8
For the second best do.	5

## FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than twenty yards in quantity	\$12
For the second best do. do.	8
For the best double milled Kersey, 3-4 yard wide, not less than twenty yards in quantity	12
For the second best do. do.	8
For the best Coating, 3-4 yd. wide, not less than 20 yds. in quantity	3
For the second best do. do.	6
For the best Flannel, 7-8 yd. wide, not less 45 yds. in quantity	10
For the second best do. do.	7
For the best yard wide Carpeting, not less than 30 yards in quantity	15
For the second best do. do.	7
For the best 5-8 yard wide Stair Carpeting, not less than 30 yards in quantity	10



For the second best do. do.	7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long	6
For the second best do. do.	4
For the best Woollen Kuit Hose, not less than 12 pair in number	5
For the second best do. do.	3
For the best Worsted Hose, not less than 12 pair in num- ber	5
For the second best do. do.	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number	4
For the second best do. do.	2
For the best Men's Woollen Gloves, not less than 12 pair in number	5
For the second best do. do.	3
For the best Linen Diaper, 5-8 yard wide, not less than 30 yards in quantity	5
For the second best do. do.	3
For the best yard wide Diaper, (for table linen) not less than 30 yards in quantity	10
For the second best do. do.	5
For the best specimen of Sewing Silk, raised and spun in this State, of good fast colours, not less than one pound	5
For the second best do. do.	3
For the best Linen Cloth (for shirting or sheeting) one yard wide and twenty-five yards long	8
For the second best do. do.	4
To the person who shall produce the best specimen of any Cotton fabrics in private families, not less than five pieces	20

All the above manufactures of which the material is either in whole or in part sheep's wool, must be made of wool of the growth of the United States, and manufactured within the State of Massachusetts. And all Manufactures, when presented, must have a private mark, and any public or

known mark must be completely concealed, so as not to be seen, or known by the Committee, nor must the Proprietors be present when they are examined; in default of either of these requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, Manufactures, or Articles, may be offered for premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever merely from a want of competition, any of the claimants may be considered entitled to the premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered, the Trustees may, having regard to the circumstances of the competitor, award either one of the Society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the Society's premiums shall be discovered to have used any disingenuous measures, by which the objects of the society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but be rendered incapable of being ever after a competitor for any of the Society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

#### PLOUGHING MATCH.

On the second day of the Cattle Show, viz. the 21st day of October, Premiums will be given to the owners and ploughmen of the three Ploughs, drawn by two yoke of oxen, and to

the owners and ploughmen of the three Ploughs drawn by one yoke of oxen, which shall be adjudged, by a competent Committee, to have performed the *best work, with least expense of labor*, not exceeding half an acre to each plough. Notice will be given in the public Papers, at least six weeks before said day, that a piece of ground has been provided for twenty ploughs—ten double and ten single teams; and that entries may be made of the names of the competitors until the morning of the 21st. Preference will be given to those who enter first; but if, on calling the list at the hour appointed, precisely, those first named do not appear, the next in order will be preferred. There will be two Committees, of three persons each—one to be the judges of the ploughing by the double teams, the other of the ploughing by the single teams—the latter to have assigned to them a part of the field distinct from that of the double team.

Premiums as follows, (being the same for the double and single teams.)

First Plough	\$15	Second Plough	\$10	Third Plough	\$6
Ploughman	3	Ploughman	5	Ploughman	3
Driver	4	Driver	3	Driver	2

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons intending to contend for these Prizes, must give notice, in writing, to Gorham Parsons, Esq. of *Brighton*. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee on the subject. The ploughs to be ready to start at 9 o'clock, A. M.

The result of the last Ploughing Matches at Brighton, and the satisfaction expressed by so many of their agricultural brethren, will induce the Society to continue these premiums annually, in connexion with the Cattle Show, as an efficacious means of exciting emulation and improvement in the use and construction of the *most important instrument* of agriculture.

Persons intending to offer any species of Stock for premiums, are requested to give notice thereof, either by letter

(post paid) stating the articles, or to make personal application to the Secretary of the Show\* *Brighton*, on or before 19th day of October, in order that he may enter such notice or application, so that tickets may be ready at 9 o'clock on the 20th. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

All articles of manufactures and inventions, must be entered and deposited in the Society's Rooms, on Monday, the 18th of October, and will be examined by the Committees on Tuesday, the 19th, the day before the Cattle Show; and no person but the Trustees shall be admitted to examine them before the Show. The articles so exhibited, must be left till after the show, for the satisfaction of the public.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of stock, (except working oxen) will take place on the 20th; and the trial of Working Oxen, and Ploughing Match, on the 21st of October.

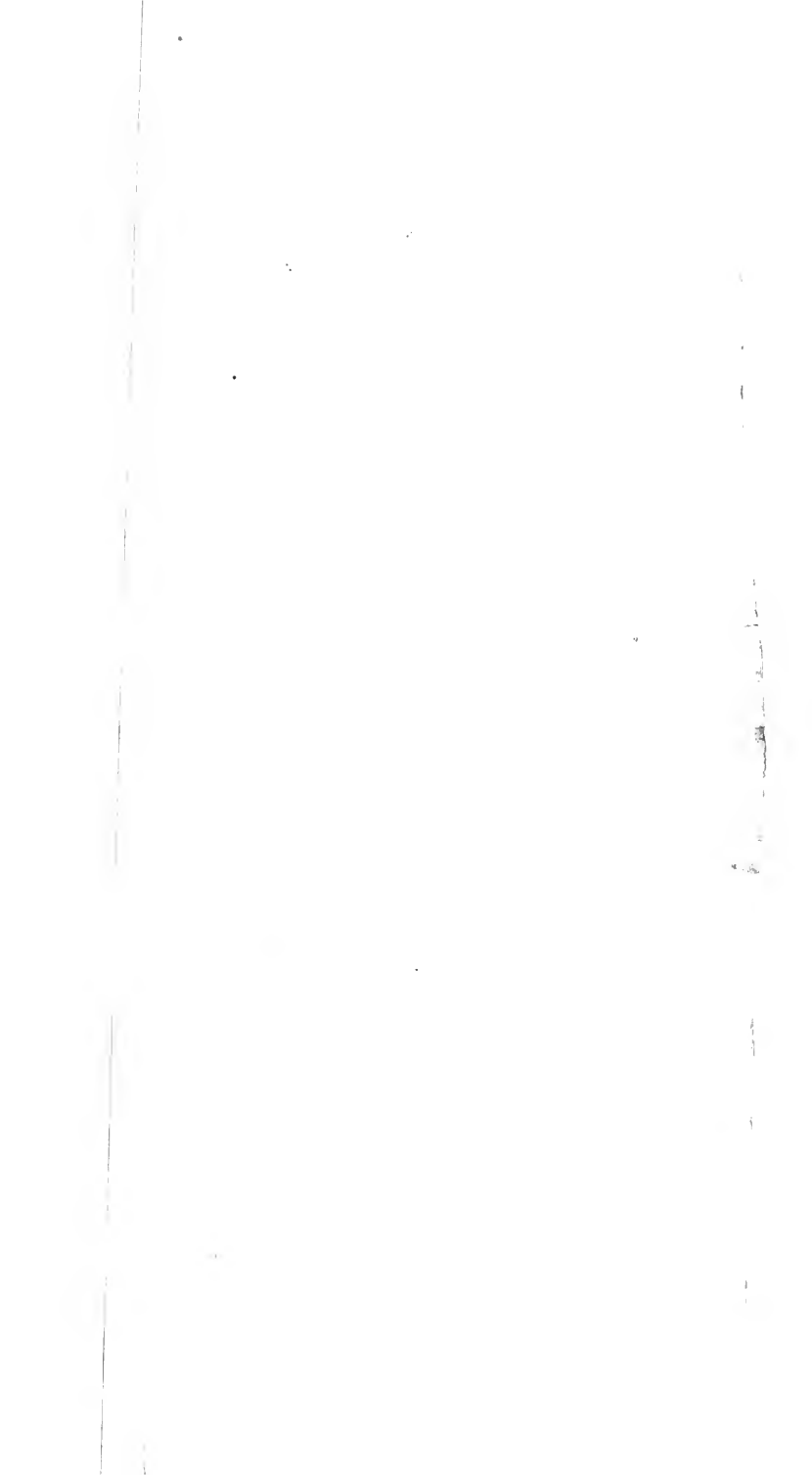
The Trustees also propose to appropriate, on the second day of the Cattle Show, their Pens for the public sale of any Animals, that have been offered for premium, and also of any others that are considered by them, as possessing fine qualities; and their Halls for the public sale of Manufactures. Both sales to take place at half past eleven o'clock, precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before 10 o'clock of the 21th. Auctioneers will be provided by the Trustees.

By order of the Trustees,

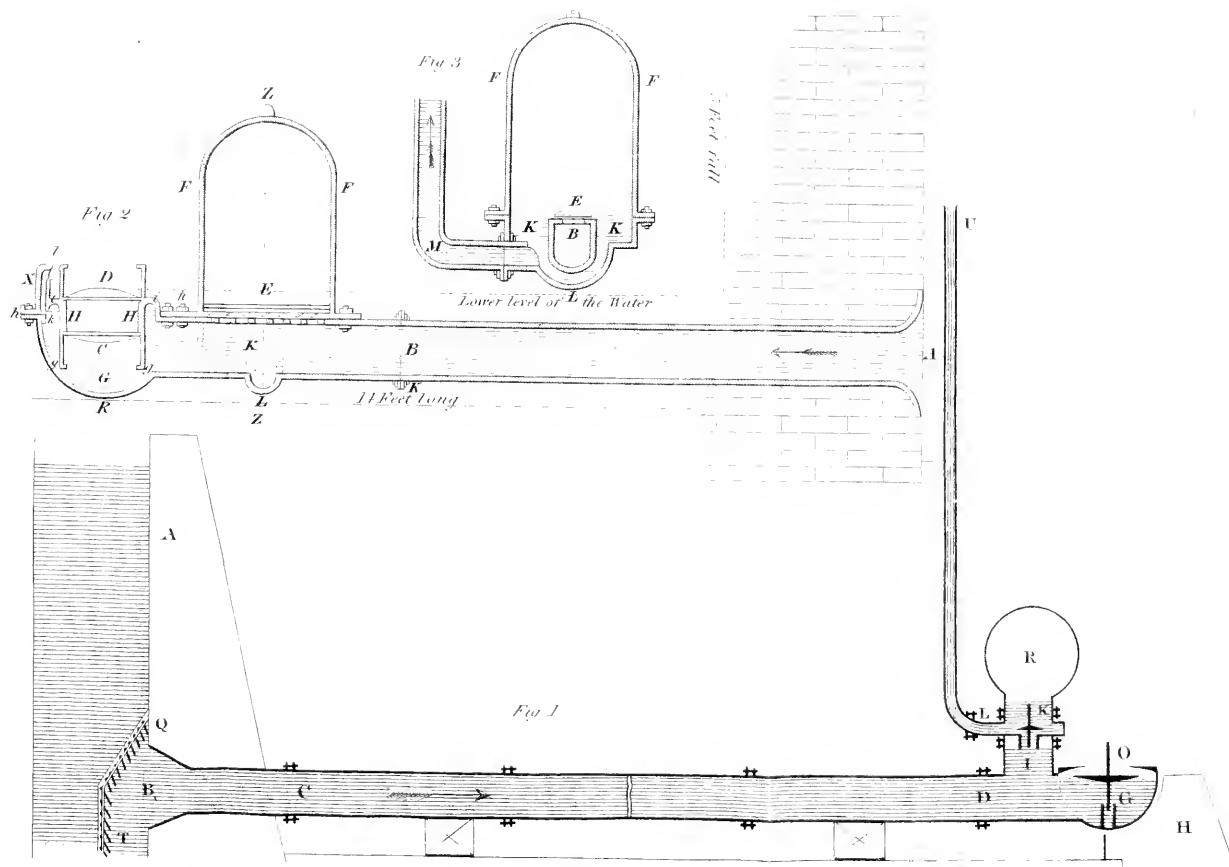
R. SULLIVAN,	} Committee.
J. PRINCE,	
G. PARSONS,	
E. H. DERBY,	

January, 1824.

\* Due notice will be given in the newspapers, of the name of the person appointed Secretary, to whom application is to be made.



# Hydraulic Ram



MASSACHUSETTS

## AGRICULTURAL JOURNAL.

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Vol. VIII.]

JUNE, 1821.

[No. II.]

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ON THE IMPORTANCE AND PRACTICABILITY OF PROCURING  
AND PUBLISHING AGRICULTURAL SURVEYS OF THE SEVERAL  
COUNTIES OF THIS STATE.

ONE of the earliest measures of the British National Society for the Promotion of Agriculture was to procure correct surveys of the several counties in England, and Scotland. The French Agricultural Societies very early adopted the same course. We mention these examples, because some weight is deservedly due to the opinions and practice of the two most enlightened, and rival nations, of Europe. The result of their efforts has been a more perfect geological, statistical, and agricultural account of those countries, than could have been obtained in any other way. In France, where there are, we believe nearly as many agricultural societies as there are departments, there exist the most ample means of ascertaining not only the character of the soils of the several departments, but of every branch of industry, within these departments. In England, and Scotland, these surveys have been rendered still more perfect, than in France, and they have been deemed of so great importance as to be incorporated in their latest scientific work, the Supplement to the British Encyclopædia. Geography, before these minute surveys, was a very limited science. It gave the boundaries of states, their rivers, lakes, mountains and general produc-

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tions, but it furnished little information as to the distinction of these particulars in the several countries, of which it professed to give an account. You might indeed learn that the tin mines were to be found in Cornwall, and the copper mines in Wales, and Anglesea—and iron mines in Dalecarlia, but minute accounts of the geology, and productions of each county were unattainable. There were indeed no means of ascertaining the comparative riches, and power of each district of any state. Yet it cannot be doubted, that such minute knowledge of the productions, and natural advantages of every part of any country is essentially necessary to a sound, and judicious estimate of its resources, and to an advantageous application of these resources to the general good. A county or district might possess articles of great value and importance to its neighbouring districts, but for want of a proper diffusion of the knowledge of the facts, the neighbouring districts might at great, and unnecessary expence, seek from abroad those articles, which they could more cheaply obtain at home. A quarry of slate upon our present system, or of coal, might remain for half a century unknown, or the knowledge of it be confined to the vicinity, but a thorough examination of the soil and productions of every county in the state, and published under the auspices of a general society would soon make us familiar with the capabilities of our country, and thus essentially promote its prosperity. The courses of rivers, and streams, their falls, their capacity to give extension to our increasing manufactures, would be soon made known, instead of the present tardy process of individual exertion. We should also have a much better comparative view of the resources of every part of the Commonwealth, and those portions, which were defective in their agriculture, and manufactures, would learn from those, which were more advanced, and strive to emulate, or exceed them.



It is to be doubted, whether any, the most intelligent man in the state, could give a tolerably accurate account of the soil, productions, agricultural practices, or usages of any one county in the state *except* the one, in which he resides, and it may be questioned whether any man however intelligent is at present able to give a correct account even of his *own county*. Such an account can only be procured by the united efforts of many enlightened men among whom must be included some persons of science. That the natural history of our own state was imperfectly known ten years since is proved by the works of Bigelow, and Webster, and Hitchcock. No man who has read their works can deny, that he has *learned* much which he did not *know before*, and yet these learned men will be the first to *admit*, that our country has been *as yet very imperfectly explored*. It is as true that we are ignorant of the productions of our state in the gross, whether it respects our agriculture or our manufactures. The miserable and defective details taken by the officers appointed to return the census who were paid a per diem allowance, scarcely deserve the name of information.

The most natural course of obtaining this information, the most easy, and the most perfect would be the voluntary exertions of the several local societies for promoting agriculture.

Their employments are now too few for their numbers, and their talents. They require a new and specific object of research to encourage, invigorate and stimulate their exertions. That object will be found in collecting the materials for a statistical history of their several counties—their natural advantages or disadvantages—their improvements in agriculture, and in manufactures, their races of animals—the several breeds which they raise and encourage—whether they have derived any benefit from modern changes in them, and how great. By such an effort, the local societies will have the *esprit du corps*, the *local pride encouraged*. While

every report will be confined to a fair exhibition of facts, yet knowing, that every neighbouring county will be their rivals, and strict judges, each society will be induced to give as full and favourable an account, as facts will authorize them to do and no more. There will be a struggle also as to the comparative talent which shall be exhibited in the several returns. As these reports will be printed by the General Society, and form a part of the history of the state, the ability with which any particular county report shall be executed, will be known, throughout the Union, and perhaps in Europe. The local societies will probably select the ablest men in every *branch* to give the history of that *branch*. We may hope then to advance by these means more efficiently than we could by any other, the geographical, geological, agricultural history of this state. It is true we have no funds to pay gentlemen for this attention. We have not the 22,000 dollars per annum at the disposal of the British Royal Society—nor have we the aid which has been most nobly afforded by Stephen Van Ranselaer, Esq. for a geological and agricultural survey of the county of Albany, but we offer what in New England is, we hope, enough, *public favour*, and *reputation to the contributors*. We fully believe, that if the local societies will cautiously, and with a deep conviction of its importance name gentlemen of their own counties, to superintend the work, selecting *botanists* for that *branch*. Geologists and mineralogists for these sciences—and intelligent cultivators, and experienced manufacturers for these departments, we may have the pleasure and benefit of having detailed surveys of each county, of which we may be proud, and we pledge ourselves, that this journal shall to the exclusion of all other matter, if it be necessary, be devoted to this important department of knowledge.

As to the benefits which such an inquiry and such publications will confer on the agriculture of the state, we should hope there could be no dissenting or doubting opinions. If

no one man knew, what his *neighbour did*, he never could learn any thing *new* except by his own unaided genius, and as invention and genius are rare gifts, the progress would be necessarily slow. Such is our present state in a considerable degree. We know not the actual state of improvement beyond our own limited sphere. It will be seen, that if our plan, which is that of the English surveys, shall be carried into execution, we shall *know all* that we could wish to know, as to every part of the state.

We have not the sanguine confidence to hope, or expect, that our suggestion will be *at once* carried into complete effect, yet we do hope, that some two or three of the most opulent counties will commence it. We hope that Worcester, Essex, Berkshire and Hampshire will attempt it. If they do not, it will certainly not arise from deficiency of talent in those counties; but we apprehend, from *doubting its utility*. Yet we should ask, in what better mode can you procure a good statistical account of our country? and how can the members of the agricultural societies be more honorably or advantageously employed than by devoting their time to the extension of the means of ascertaining the actual state of industry?

The surveys in France and England have generally extended to the following objects;—the description and natural, and statistical history of the several counties, districts and departments—“ Their situation, extent, divisions (such as towns, parishes, &c.)—Form and surface whether mountainous or flat, or partly the one and the other—climate, soils, minerals, waters, including lakes, ponds and rivers—canals, agriculture, including breeds of cattle—agricultural productions, modes of management, manufactures and commerce, population.”

Although it cannot be expected, that we shall receive as full returns, and as complete an history as in countries where it is effected by governmental aid, yet we think that our

county societies may if they deem it worthy of their attention furnish very interesting accounts of their respective counties. Where there are gentlemen who are conversant with botany it would be very desirable to add some account of their plants, particularly of their forest trees—and of the state of their forests. It cannot be doubted that such an inquiry would conduce in a greater degree to the knowledge of the true state of our country, and do more towards the advancement of its agriculture than any thing which we have as yet effected. It ought to be known by way of stimulus that the French surveys which have been very ample and satisfactory have been made at private expence chiefly.

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## SWINE.

[From the New England Farmer.]

**T**HE swine or hog is a valuable and useful animal and a number of them is almost as necessary for the farmer as a stock of cattle.—Hogs are not only valuable on account of the meat and fat they afford for the market and home consumption but highly useful in the business of making manure.—It is an indisputable fact that by proper care and attention, a greater quantity of good manure can be made from swine than in any other way with the same expence.

Much exertion has been made within a few years to make our hogs better by introducing new kinds and crossing different breeds and in some instances they have been essentially improved but in others wretchedly depreciated.

A kind have lately been introduced into this vicinity denominated the English breed. I am one among many others who have incautiously ventured to make trial of them to my great disadvantage as they turn out to be inferior in every point to any that I have had before them. I can with the

same expense make one of my old sort weigh at least one hundred pounds more than one of the new kind so that upon a moderate calculation there is a loss of not less than five dollars in each hog of the English breed.

Much credit is due to the committee on swine at our last cattle show on account of their decision between the competitors for premiums.—The gentlemen composing this committee are well known to be practical farmers and well qualified to perform the duty assigned them.—Their judgment was decidedly in favor of the larger kind of hogs in preference to those mouse eared chubs which are to be seen in many of our styes more resembling woodchucks than swine.

The credit of this famous kind of hogs is undoubtedly sinking in this vicinity. Several of my neighbours have lately expressed their disapprobation of them and their preference for a larger kind as being better and much more profitable.—I am determined to be rid of them as soon as practicable and for the time to come be contented with my old sort until I have better evidence than I had before that a new kind is preferable.\*

\* This statement gives a view of the subject very different from that to which we have been accustomed. We have been told by experienced agriculturists that the breed of swine, originally introduced into this country from England, and which had its origin we believe, from the celebrated Bakewell, has proved a great benefit to agriculturists. That very correct and scientific cultivator, Dr. Fiske of Worcester, stated (in a piece originally published in the Worcester Spy, and republished in the New England Farmer, vol. i. page 107,) as follows:—"My hogs are of the genuine Bedford breed so called in England, and experience has proved to my satisfaction that this breed is far the best that has been introduced into this country. They are quiet in their nature, fat easy, and with little expense or trouble. I have had some weigh at 12 months, about 340 lbs.; and a considerable number, at 13 months old, 400 lbs."

It is possible, however, that the breed, originally excellent, may have deteriorated *for want of crossing*. "Breeding *in and in*" as it is technically called, will in time ruin any breed. See N. E. Farmer, vol. i. page 270.—*Editor N. E. Farmer.*

Swine must have suitable food and enough of it, together with good care and attention in order that they may do well and be profitable. They should always be attended by the same person for if one takes the whole care of them, he will better know what they most need and how much to give them. They should never have any more given them at a time than they will readily eat with a good relish, for if they have more than this it will cause them to become dainty, and lose their appetite, so that frequently they will eat but little more than enough to keep them alive.

The practice of grinding cobs or ears of corn, for hogs, to me, appears to be worse than useless; and were it wholly dispensed with, I think we should see better hogs and hear less complaint about their being dainty and doing so poorly. It is a fact, which I have proved by actual experiment that hogs which have for a considerable time been fed upon good meal, will not at any rate eat that which is made of clear cobs, and very unwillingly that which is made from ears of corn.

My method of feeding hogs is to boil potatoes night and morning during the winter and spring, with which I put a small quantity of meal and give it to them which makes them grow and do well. Through the summer I give them the wash of the dairy, and about the first of September put them to fattening, and give them as much meal as they will eat; and in this way I can make as good pork as any of my neighbours.

A FARMER.

*Worcester, May, 1824.*

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We insert the foregoing article from the New-England Farmer not because we approve of it, but to give us an opportunity of replying to it. We should be the last to prevent or limit free inquiry, as to any subjects of agriculture, but we must deprecate and lament, that spirit, which clinging fondly to old usages, strives to undervalue new improvements,

simply because *they are new*. The tendency of the foregoing article is to produce a retrograde movement in agriculture. Our farmers are sufficiently slow in adopting new improvements, without the aid of essays to warn them against them. If there be any one valuable agricultural novelty introduced into this country, by the inquiring spirit and enterprise of agricultural societies, it is in the breed of swine. We had the materials in our country of improving the breeds of most other domestic animals without recourse to other nations. Care in selection and in rearing our animals would soon have placed us on a footing with any nation in Europe. Our neat cattle were generally good, and individual animals might have been found in New-England which under the skilful management of such men as Bakewell, and Princeps and Champien would in twenty years have rivalled either the Holderness or the Herefordshire races. But as to sheep we were deficient in fine woolled, and in long woolled animals, and it would be as idle to pretend that we could have equalled the merino sheep in fineness of fleece, or the improved Leicester sheep in length of staple as to contend that the Congo negroes could have produced, without a cross, as fair, and fine forms of the human species, as the European or North American.

It is full as true, that we did not possess in America a fine race of swine, and that by no possible art could we have procured it from our *native breeds*. If we have made any improvement in this article, it has been owing to crosses with foreign breeds. Swine are valuable only, or principally, as furnishing food for man. It is therefore more true with respect to them, than even as to cattle and sheep, that those breeds are to be preferred which shew an early and constant disposition to fatten—which afford the greatest quantity of flesh in proportion to offal, and to the quantity of food consumed. It is highly injurious to the interests of agriculture for gentlemen to throw out general surmises against any new

improvement, any amelioration or supposed amelioration of our breeds of domestic animals without thorough and careful and patient experiment ; and it is the duty of sincere friends to agriculture not to make assertions simply, but to accompany them with *facts*, and experiments fairly and honourably stated. Has the writer of the foregoing article taken two or more pigs of the old breed and of the new ones, and placed them in the same pen, fed them precisely in the same manner? Has he killed or weighed them at the same age and ascertained, that the new breeds do not give as much pork as the old ones? *If he has so done let him state the facts.* What was the new breed he raised? Was it the Bedford, or the Wellington, or the Scotch breed, or was it a cross? From whom, did he procure the breed, and is he sure it was of an *approved race*?—When we have these facts, we can come to a decision much better, than on anonymous authority, and general assertion.

But should the writer of this article have been so singularly unfortunate, as to find a breed of hogs of recent introduction, inferior to our old most expensive, and unprofitable race, we can tell him, where he may find hundreds of persons, who have been more successful.

We have tried the new races against the old, with the same treatment, and we have found uniformly, that the improved breeds gave double the quantity—double the weight of pork in the same number of months, which the old race gave, and with about one third less food.

But the writer of this article has only managed on a small scale, he has however witnessed the effects of the new breeds on an extended one. Is it pretended that the new breeds want *size*? They have often weighed when slaughtered 700 pounds—Ordinarily at 18 months they weigh from 4 to 500. The advantages they furnish are more *consumable* food in proportion to their whole weight : *flesh on those parts where it is wanted, and a greater proportion of fat—and this too with less food.*



It ought to be known, that the breeds have been constantly *improving*. The first improvement was the introduction of the Byfield and Bedford. This has been followed by that of a new English breed, called the Wellington—and a Scotch breed, the Sire, of which, here, is called Dalhousie. These last breeds, and their crosses, have surpassed any which we have heretofore had. But that we may put an end to debate, so far as the best authority on such a question may go, we shall mention the opinion of one of the most extensive packers of pork in the United States—a man of sound and excellent judgment, out of his immediate employment—who perhaps has seen more slaughtered hogs, than all the farmers in the county of Worcester put together, for he has been extensively concerned in packing pork, and making hams for thirty years.

Mr. Edmund Winchester has said, that the improvement in the breed of swine, (alluding to the new breeds) within a few years is richly worth to *Massachusetts only*, the sum of one hundred thousand dollars. This simple fact, this simple opinion, of the greatest purchaser will and ought to go further with our farmers, than hosts of individual opinions of raisers of swine, who could only have their own experience or that of their own vicinity, and that experience perhaps not very carefully considered.

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[Communication.]

#### HYDRAULIC RAM.

##### A MACHINE FOR RAISING WATER.

SOME of the readers of the Repository may be benefited by the following account of a foreign invention not much known in this country, called the Hydraulic Ram. It is a machine of apparently simple construction, by which water may be raised to any height for the purposes of irrigation

and domestic use, by means of a small head or fall of water, in low grounds. The command of a stream or pond, which will yield a foot fall will enable the possessor to conduct a portion of the water to an elevation of several hundred feet. What portion, will depend upon the relative height of the fall and of the reservoir. Before we give a description of the machine, and the mode of its operation, it may be well to say something of its history and of the estimation in which it is held abroad. Dr. Young, in his *Lectures on Natural Philosophy and the Mechanic Arts*, Vol. 1. p. 337, 338, speaks of the invention in the following terms. His account is principally valuable for the historical notice at the close; for although he states the principle correctly, his description of the operation of the machine is imperfect.

“The momentum of a stream of water, flowing through a long pipe, has been employed for raising a small quantity of water to a considerable height. The passage of the pipe being stopped by a valve, which is raised by the stream, as soon as the water becomes sufficiently rapid, the whole column of fluid must necessarily concentrate its action almost instantaneously on the valve; and in this manner it loses the characteristic property of hydraulic pressure, and acts as if it were a single solid; so that supposing the pipe to be perfectly elastic and inextensible, the impulse must overcome any pressure, however great, that might be opposed to it, and if the valve open into a pipe leading to an air vessel, a certain quantity of the water will be forced in so as to condense the air, more or less rapidly, to the degree that may be required for raising a portion of the water contained in it to any given height. Mr. Whitehurst appears to have been the first that employed this method: it was afterwards improved by Mr. Bolton; and the same machine has lately attracted much attention in France under the denomination of the Hydraulic Ram of Mr. Montgolfier.”

Joseph Montgolfier of Paris long known in France for his

ingenuity and skill in the mechanic arts, claims to be the inventor of the Hydraulic Ram. An account of it was published by him at Paris in 1805, in a pamphlet form. In this publication he speaks of it as being already in use in various parts of France and in some other parts of Europe.

To raise water above its source by machinery so as to have the use of it at less cost than it is worth when obtained has been always a desideratum where a great quantity has not been wanted. To feed a distillery or a large brewery, where water must be had at all events, the expense of procuring it by horse power or by steam is an item of the necessary expense of the manufacture for which the establishment must be indemnified in the price of the liquors. But when the question is of a supply of water for irrigating lands—for the use of the farm yard and for domestic purposes, forcing pumps, bucket wheels and machinery to work by wind are almost universally rejected as too expensive. Feeling the force of this objection to all kinds of machinery heretofore in use for such purposes I applied myself, says Montgolfier, to discover some other mode, to which this objection could not be made, aware that I could hope to succeed only by the aid of some new principle. This he obtained and has applied with entire success. The power employed is two-fold. 1st. The momentum of a water fall. 2d. The expansive power of a body of air confined in an air chamber.

Fig. 1. in the Plate gives a section of the machine as described by Joseph Montgolfier. A Q represents one side of a Box by which the water descends. B the cone through which the water passes into the tube C D which may be either of cast iron or copper. It rests on a piece of timber its whole length and is firmly fixed in mason work at both ends. The height of the fall in the drawing, is supposed to be four feet, and the tube C D twelve feet.

At the end of the tube C D is attached what is called the Ram's head. This part is also either of iron or copper. In

it there are two openings—one at O which may be closed by the valve G, ascending. The other I which may be closed by the valve K, descending. Both these valves are guided by iron rods which pass through their centre.

The orifice at  $\phi$  opens into a chamber R which is called the air chamber. Towards the bottom of this is an opening to which is fitted a tube L U which is to receive the water to be raised, and the length of which is according to the height to which the water is to be conducted. The head of the machine is firmly fixed in masonry H.

When the machine begins to operate, the orifice O is open and the water as it descends and passes through the tube C D flows out at first freely at O and runs to waste. But soon the water acquires an augmentation of velocity sufficient to press up the valve G so as to close the orifice O. The water in the long cylinder B C D O is thus suddenly arrested in its course and reacts with a force which opens the valve K, and gains a passage for the water into the air chamber R. The communication with the atmosphere by means of the tube L U is cut off by the water which enters the lower extremity of this tube. The valve K is immediately pressed down by the weight of water above it. As soon as the water has found a vent at I, the pressure of the water upon the valve G being removed, the water begins again to flow out to waste at O, and the whole process is again repeated. The water which is thrown into the air chamber through the opening at I, compresses the air confined in it, and the air by its expansive power forces the water into the tube L U, and to any given height. The time required for the entire process is from half a second to three seconds according to the size of the machine, &c.

Water has been carried by this machine to a height of 1280 feet. The weight of this column of water is equal to 40 times the weight of the atmosphere. Of course the air in the air chamber was reduced in compass to a fortieth

part of the space it would occupy when free. In the subjoined notice is an account of one of these machines in use in Switzerland.\*

It will be readily understood that every part of a machine like this should be of great strength and well constructed. The thickness of the cylinder B C D should be double that of the ascending tube L U. The thickness of the latter in proportion to its diameter and height. It should be observed that if the elevation to which the water is to be carried be very great the ascending tube need not be of equal thickness throughout; it is only at the lower part of the tube where great strength is required.

It has been ascertained that a tube of sheet lead the twelfth of an inch thick and an inch in diameter, will support a column of water fifty feet in height.

An inch tube of copper will support a column 400 feet.

Do. of brass 300 feet.

A tube of cast iron two inches diameter and one third of an inch thick, will support a column 500 feet.

If the ascension tube is to be bent in its course towards the reservoir, the turns should be as little abrupt as possible, in order that the water may pass freely.

As respects the cost of the machine, this varies of course

\* The Hydraulic Ram of Mr. Montgolfier has been constructed at Schaffhausen by Counsellor Fischer in a very ingenious manner. The machine has the form of a beautiful antique altar. A basin, about six inches in depth and from eighteen to twenty in diameter, receives the water, which enters into pipes three inches in diameter, that descend in a spiral form into the base of the altar. The water by its weight puts in motion a valve; a third nearly of the water escapes, but the rest is forced into the receiver, and thence rises in very narrow pipes. As it ascends slowly the resistance of the air makes no sensible impression, so that by means of this machine, which continually acts by itself, water may be conveyed from a lake or a river to houses situated on a mountain. Mr. Fischer has conveyed water by it to a castle which stands at the height of several hundred feet above the level of the Rhine.

*Tilloch's Philos. Magaz. Vol. 20. p. 92*

according to circumstances. It may however be said in general terms that this will depend, 1st. Upon the quantity of water to be raised. 2d. The elevation of the reservoir. 3d. The distance of the reservoir. 4th. It will be less, in proportion to the height of the fall.

A few examples will afford a better idea on this point. Suppose the quantity of water to be obtained be a stream of one inch diameter.\*

First example. Fall 6 feet—Elevation to which the water is to be carried 20 feet. Price \$24.

Second example. Fall 4 feet—Elevation to which the water is to be carried 50 feet. Price \$250.

This estimation to be doubled for local and incidental expense in placing the machine. This is the rate of expense in Paris, as given by Mr. Montgolfier.

The cost of repairs hardly need be calculated. Unlike most other machines for the same use, this requires little cost to keep it in order.

When the height to which it is desired to raise the water does not exceed ten feet, a fall less than a foot will be sufficient; even six inches will be enough.

Some have imagined that by the aid of the Hydraulic Ram, the water employed to turn a wheel might be reconducted to the pond above. This is an error. The power employed cannot be made to reproduce itself.

This machine will raise not more than half the water employed to set it in motion—the rest will run to waste.

To ascertain what proportion the quantity of water which can be obtained at a certain elevation bears to the water which passes into the machine, double the number of feet of this elevation, divide by the number of feet of fall, and the quotient will be the relative quantity.

\* A stream one inch diameter will give 14 quarts per minute, equal to 34 hogsheads in 24 hours. Each inch contains 144 lines. A stream whose diameter is one line will supply 35 gallons of water per day; sufficient for the ordinary use of one family.

In the year 1816 eleven years after Joseph Montgolfier's first publication, a patent was granted in England to Pierre François Montgolfier for an improvement on the original machine. Figures 2 and 3 of the Plate are given by him to illustrate his specification, which is here copied that a perfect understanding may be had of the latest improvements, upon a machine which appears to have strong claims to the attention of the people of this country. We copy from the Repository of Arts, vol. 30.

In figure 2. The large pipe A B is called the body of the Ram ; the end A is carried through the wall or bank of the reservoir, river, or other supply of water, the other extremity R, of the pipe, has an opening H H, capable of being closed by valves C or D ; but when the said valves are open, the water of the reservoir will run through the pipe A B and issue freely through the valves C D, with a velocity proportionate to the height of water in the reservoir above the orifice H H of the valves, through which the water makes its escape or rather above the level of the standing water in which the whole machine is immersed up to the level of the dotted line X, so that it just covers the valve D.

The end A of the pipe which receives the water of the reservoir is formed like a trumpet-mouth, that the water may flow more readily into the pipe ; and the length of the pipe A B must be regulated according to the height of the fall of the water which is to produce the current through the pipe. The pipe is composed of several pieces or lengths, screwed together by flanches, or other similar means ; but it is in the end piece B R, which I call the head of the Ram, that the moving parts of the machine are placed. The extremity of the pipe or head of the Ram terminates with a portion of a sphere R, in the upper surface of which is a large circular opening, to receive and hold the seat of H H, the valves C D, at which the water issues ; but when the internal valve C is closed, as in the figure, it prevents the water from issuing.

When the valve C opens, it descends into the position of the dotted lines G, and leaves a free passage. Its motion is guided between three or four stems g, which have hooks formed at the lower ends, to retain or support the valve, when opened; and these stems are fixed by screws, so that they can be regulated to allow the valve to open a greater or less passage for the water. The valve C is made of metal, and hollow, for it has a hollow cup or dish of metal attached to its lower surface. This at the same time renders the valve lighter in the water, and gives it a convex surface, which (when it is open as shown by the dotted lines) corresponds with the interior concave surface of the spherical end R of the head of the Ram. The seat of the valve which is marked H, is composed of a short cylinder or pipe, of which the opening is much greater than the transverse section of the pipe A B. This short cylinder is screwed by its flanch h h into the opening of the upper surface of the head R of the Ram. The said valve seat H H is so formed as to have an inverted cup around the upper part of the short cylinder; that is a circular channel or annular space i i, which will contain air and from which the air cannot escape when the water compresses it. k l is a small pipe, leading from the said annular space to the open air; it is furnished with two small valves, one at K opening inward, to admit the air to enter into the space, but to prevent its return; and the office of the other, at l, is to admit a certain quantity of air, and then to shut and prevent any further entrance. D is a valve similar to C, but shutting down on the outside of the seat H H; its use will be hereafter explained.

The upper part of the head of the Ram at E is made flat and has several narrow openings across it, which are covered by valves E, to allow water to pass out from the pipe A B, but to prevent its return. And on each side of the head of the Ram, at the part opposite to the valves E, is a hollow enlargement as is shewn by the dotted lines K in Fig. 2 to



form a circular basin, through the centre of which the pipe A R of the Ram passes, as is shewn by the transverse section in Fig. 3. But the pipe instead of being circular is flat at top, at that part, to form the seats of the valves E. This basin is covered by an air vessel F, screwed down by means of a flanch round the edge thereof. All the water which issues from the pipe through the valves E will flow off on each side and be received in the basin K. There is a passage L communicating from one of the enlargements to the other; for which purpose it curves down and descends beneath the pipe of the Ram; and the pipe M Fig. 3 that carries away the water which the machine raises, must proceed either from this passage or from some other part of the basin K, so as to receive the water which has passed from the body of the Ram through the valves E and the air vessel, into the basin K K.

The action of the machine is as follows. Suppose the pipe full of water. If the valve C is opened, the water from the reservoir will flow through the pipe A B, and issues through the opening H, it will lift up the valve D, and escape; but the current having continued until the water has acquired a certain velocity, the force of the current buoys up the valve C, and closes the passage; the motion of the water contained in the pipe A B will thus be suddenly arrested, and by its *vis inertie* or moving force, it will exert a sudden pressure against the valve C and against all the interior parts of the pipe. The small quantity of air contained in the space i i compresses into a smaller space, and by its elasticity takes off the violence of the shock or blow which would otherwise be produced. This pressure opens the valves E, and a portion of the water will be driven into the air vessel F, which is supposed to be full of air, compressed or condensed, till its elasticity equals the pressure of the column of water which is to be raised up the pipe M by the action of the machine.

The water which is forced into the air vessel causes the air therein to be condensed to a greater degree of elasticity and

it will exceed the pressure of the column of the water in the pipe M; by degrees the air will therefore force through the said pipe M all the water which was injected through the valves E, and cause that quantity of water to issue from the upper extremities of that pipe. The moving force, or *vis inertia*, of the mass of water, which was in motion in the pipe A B, having expended itself by forcing a portion of the water into the air vessel, and making a still greater compression of the contained air, a recoil of the water in the tube will take place with a slight motion from B to A, this arises from the reaction or elasticity of the air contained in the space i i, and also of the metal of which the tube is composed. The valves E shut and prevent the return of the water which has been forced into the air vessel. This recoil of the water in the pipe towards A causes a slight aspiration within the head of the Ram; and the valve D having descended by its weight, prevents the water X with which it is covered, from entering through it; but the air passes through the passage l k, and opens the valve k; and a small quantity of air is sucked into the space i i; but this is a very small quantity, because the valve k closes as soon as the air flows with a rapid current through the passage. During the recoil the valve C, having nothing to sustain its weight falls and opens the passage, and as soon as the force of the recoil has expended itself, in acting against the column of water contained in the reservoir, at the end A, the water begins again to flow through the pipe from A B, and repeats the action which I have described—viz. it shuts the valve C when it has acquired the intended velocity, and being thus stopped, the *vis inertia* condenses the air at i i, and opening the valves E, forces a quantity of water into the air vessel, from which the reaction of the contained air will drive it up the pipe M. The *vis inertia* of the moving column of water, being thus expended, the recoil commences by the reaction of the air at i i; the valves E shut, and the valve D likewise. the aspiration produced by the recoil draws some

air through the valve *k l*. The valve *C* falls by its weight, and opens the passage, so that the water in the pipe *A B* can resume its motion when the recoil has exhausted itself.

The small quantity of air which is drawn into the machine, through the air valve *l k*, at each aspiration, causes an accumulation of air in the space *i i*; and when the aspiration of recoil takes place, a small quantity of air passes from the space *i i*, and proceeds along the pipe till it arrives beneath the valves *E*, and lodging in the small space between those valves, it will be forced into the air vessel at the next stroke, by which means the air vessel is always kept filled with air.

The machine represented in the drawing is calculated to raise water up the tube *M* 100 feet above *X*. When the fall by which it is worked is five feet, that is the difference of the levels *Y* and *X* of the water in the reservoir and the lower level *X*, the length of the pipe *A B* is to be fourteen feet long from *A* to *B*, and six inches in diameter. The dimensions of all the other parts may be found by the scale. Such a machine may be expected to expend about seventy cubic feet per minute to work it, and to raise up about two and one third cubic feet *per* minute; but these quantities cannot be exactly stated, because they depend upon the care and accuracy with which the machine is constructed. Under different circumstances having a greater or less fall, or quantity of water, the dimensions of the machine must be calculated accordingly.

The hydraulic ram, represented in Fig. 2 and 3 is adapted to give motion to the hydrostatic presses which are in common use under the name of Bramah's presses. For this purpose it is only necessary to apply the pipe *M*, (Fig. 3,) to the cylinder of the hydraulic press, and at each stroke of the ram, a small quantity of water will be forced or injected into the cylinder of the press, and will thus produce the ascent of the piston of the press, in the same manner as is now performed by the small injection pump worked by the force of

men. But by the application of my improved hydraulic ram to that purpose, the press can be worked in any situation where there is a small fall of water, and the ram may be set in motion whenever the press is wanted.

The specification so far contains not only the improvement by P. F. Montgolfier, but also a general description of the Hydraulic Ram and its mode of operation. Those who may wish to ascertain the nature and extent of these improvements and the uses of them, are referred to Vol. XXX. of the Repertory of Arts, which may be seen at the Boston Athenæum. They will there find that by these improvements the machine is fitted to give motion to various kinds of machinery for manufacturing purposes to a limited extent.

The surface of our state is broken and abounds in water falls more or less elevated. It will be seen at once that those which are not high enough to afford mill power, and are turned to little or no account, and, in many instances, carry a supply of water sufficient to irrigate the adjoining hills in a time of severe draught, offer a resource by the aid of the hydraulic ram which may change the character of a farm and enable it to yield abundant crops where none such are now or can be by other means obtained. The expense of wells in some parts of this commonwealth is enormous, where, nevertheless, streams with small falls flow at no great distance and within a hundred or perhaps thirty feet of the elevated spot where water is thus difficult to be gotten. The hydraulic Ram in such cases might come cheaper than the cost of a well and pump, with the further advantage of its yielding a constant supply without manual labour. Our country is subject to severe summer drought, and often while the hills are parched and wells are failing, some deep valley at no great distance affords a perpetual spring with perhaps a natural fall of a few feet in its course; if not a natural fall, it may be so situated that an artificial one may be had with little labour. Under such circumstances, in

some cases, the hydraulic ram might be of invaluable advantage.

In the No. of the Massachusetts Agricultural Journal for January 1822, will be found General Hull's interesting communication on irrigation. Though the benefits from this source to the farmer are familiar to most, we think it may be useful to repeat here the closing part of his remarks, as they place in a strong light one of the most important applications of the Hydraulic Ram.

“Those fields which were dry, and without hardly a blade of green grass, after the first mowing, are now at that season covered with the richest verdure. Such parts of my mowing grounds, as I have irrigated, without carrying on any manure, excepting what was carried on by the water, have greatly increased, both in the quantity and quality of the hay; and according to my best opinion, there will be no occasion of breaking up the land, as long as the operation of the water is continued. Some parts of the land, which I irrigate, I have manured, and have found myself amply remunerated. The coarsest and rawest manure, retaining all its strength, may be put on these lands, in the fall, early in the spring, or after the first mowing and the water not only prevents it from burning the grass, but decomposes it in such a manner, that it has a greater effect, than when it is old, and some of its virtues have evaporated, as will be the case when exposed to the sun, and the air in its preparation. When history informs us of the great advantages, which the earliest nations of which we have any account derived from fertilizing their lands by water; when it is considered in what high estimation it is held in every part of Europe, and indeed in other parts of the world; and from the few experiments which have been made in this country, what vast advantages might be derived from it, is it not matter of surprise, that more attention has not been paid to it here, and that it has hitherto remained without any patronage? In Switzerland, the first

agricultural society grants it the first premium. I believe, there is no country on earth, better calculated for improvements, by this means, than ours. Streams almost innumerable pass over it, in their natural courses, and have carried and continue to carry, the richest part of the soil into the ocean. This rich manure, which is now entirely lost, with little expense, and without the aid and labour of dung carts, might be spread over our cultivated fields, and render them productive, beyond any calculation that the most sanguine can imagine. Yet we stand, uninterested on their banks, gaze at them as they pass, without an effort to regulate their courses in such a manner, as to reap the advantages of the rich treasures, they contain. It is certainly a neglect of a blessing, which a munificent Providence has provided and offered for our acceptance."

CHICORY.

#### ON MILLET.

THIS plant has become so much an object of notice and culture in every part of the United States, at least from the state of Maine to Virginia, that it seems proper that it should have a more particular notice in this Journal, than it has as yet received. We have been more cautious in recommending it from the well known fact, that new plants often receive great and unbounded praise, from those who introduce them, and afterwards many of them are suffered to pass into neglect, as experience shall have proved them to be of little value, and sometimes even pernicious. There are innumerable examples of this sort in the history of agriculture. We might mention burnet, which had a great run for a short time in England, and was puffed in our own country, but nobody ever speaks of burnet, at present, as an article of culture. We might mention chicory, or succory, which was intro-

duced into New England as a valuable article of fodder, and has proved to be only an useless weed, rather troublesome, but chiefly confined to our highways, where it is left to display its beautiful blue flowers uncropped, even by hungry cows, turned adrift to snatch their food on public commons. Shall we add the fiorin grass? Perhaps we ought not to do it so soon, out of respect to the Rev. Dr. Richardson, yet it is but proper in an agricultural work to say, that Fiorin grass has ceased to be an object of discussion and interest in Great Britain, and we have never heard of one successful attempt to cultivate it in America. Our white weed, *chrysanthemum*, now considered as the bane of our farmers, is said to have been introduced as a valuable grass; and more recently Mr. Charles Whitlow, professing to be a botanist, urged the cultivation of a species of nettle, in lieu of hemp, to which species he affixed the name of *Urtica Whitlowii*, in the fond hope, that his name would be handed down as one of the benefactors of mankind. But we have never heard of *nettle* hemp.

What then are we to infer, from these facts? Are we to entertain distrust for all *new* plants? Certainly not. It follows of course, in agriculture, as in the mechanic arts, that there will be at least ten failures to one successful discovery. The zeal for improvement will urge man to experiments. Every man, who believes he has discovered, or introduced a valuable article, will praise it. It will be submitted to the only fair test, experience. If it succeeds, the discoverer will be honoured. If it fails, nothing has been lost by society but the expense of the experiment. The potatoe has been lately discovered in its native haunts. It was till then an unsolved question, to what region we owed this blessing. It was ascribed to Virginia, but in Virginia it is not to be found. It was ascribed to Mexico, but Humboldt could not find a trace of it in Mexico. It has however been found in Chili, but in Chili, though identically the same plant, its tubes or roots are bitter,

and small. Is not the discovery of the potato which gives to five millions of men an ample recompense for hundreds of abortive and fruitless trials, to introduce other plants? The Beta Alba, or mangel wurtzel has stood its ground for fifty years, and this country ought not to be willing to give up its share of the benefits arising from its introduction for one million of dollars. The Ruta Baga, or Swedish turnip, will also probably stand its ground, and maintain its ascendancy over the common turnip, though there is more doubt on this point than on the other.

Will the Millet continue to be cultivated? Does it deserve so to be? These are questions which we do not propose to solve, but we intend to place the history of the cultivation of *this East Indian plant* on its true ground, to give a brief abstract of its culture in Europe and America. The Millet has been long known in Europe. It is noticed very briefly in the first edition of the British Encyclopædia under the name of Milium, and was ranked among the Grasses. By the later botanists, it has been considered as a Holcus; and its botanic appellation, according to Turton's Linnaeus, is "*Holcus Sorghum*." By the Editors of the Encyclopædia, it was spoken of very slightly, and praised chiefly as furnishing good food for fowls. The American agricultural writers seem to have copied the remarks of the Encyclopædists. Deane, in his Dictionary, speaks of it chiefly as affording a grain well adapted for poultry, and the "*Farmer's Assistant*" does not assign it a higher place. Neither of them mentions it as fitted for green and dry fodder for animals on an *extensive* scale. At the outset, it is worthy of remark, that it is somewhat singular, that, since it has been known in Europe 200 years, it should not have become an object of more and deeper interest. If it be said, that Great Britain is too cold for it, yet it must be seen, that it ripens its seeds there, and 50 years since, they were used as the food of poultry, and esteemed as such. But if England is too cold, surely Lan-



guedoc and Provence, and Lombardy, and Tuscany were not. Why has it not acquired more celebrity there? Lest it should be inferred from these remarks, that we are not friendly to its culture here, we expressly affirm the reverse to be the fact. Our own experience is favourable to it, but we cannot but express our surprize, that other nations do not see it in the light that we do. Is it that we alone have first tried it as fodder, while all Europe have only looked to it, as grain? These singular facts are noticed solely with the view, that our intelligent cultivators should have the whole subject before them. It is much more proper to submit the evidence to their understandings, than to recommend an article on our own authority, or on that of any man, however respectable. The first knowledge, we possess of the cultivation of millet in this vicinity, was derived from an experiment made by a very respectable and intelligent gentleman of Boston, Dr. W——r, who gave to the public the result of his trial, which was a favourable one. It established the fact, that this plant could be grown to perfection in our climate. Some years elapsed, however, before any extensive trials were made. Many undoubtedly have been made which have not been communicated to the public. We shall mention those only which we personally know. The Hon. Mr. Quincy has for several years raised this plant on a considerable scale, not to such an extent as would in the Southern States be deemed considerable, but certainly so on the limited scale, in which the culture of New England is conducted. Our farms are much smaller than those of the Southern and Middle States, and our experiments of course are more limited. It is the prevailing opinion with us, that a little land well cultivated and thoroughly manured, yields a greater profit than much land indifferently treated. Mr. Quincy principally employed his crops of millet for the soiling of his cattle, and his success we have reason to believe was complete. He also converted some of it into dry fod-

der with success. John Prince, Esq., Treasurer of the Massachusetts Agricultural Society, has also tried this plant with great success. Dr. Aaron Dexter, late President of this Society, and one of its present trustees, tried the millet under circumstances which tend strongly to recommend it. He sowed it as late as the beginning of August, and cut and dried it as fodder, and found that it produced a very heavy crop. It has been tried by other farmers in this vicinity with success. We shall now introduce the experiments of Southern farmers as related by themselves. The following letters from John Hare Powell, Esq. will be read with interest.

FROM THE PORT FOLIO.

I have made many experiments on various soils, and at different seasons, to ascertain the product, as well as the properties of Millet. Upon light land, in good condition, it succeeds best; it requires in all cases, fine tilth, and as much strength of soil as is necessary to produce heavy oats. I have not seen, either in Europe or America, any green crop, which so largely rewards accurate tillage and plentiful supplies of manure, as the species of millet usually grown in this and the adjacent counties. I have sown it from the first of May, to the 20th of June, and have invariably obtained more fodder than could have been had from any grass under similar circumstances. In the autumn, eighty bushels of *caustic* lime per acre, were strewed upon an old sward, which was *immediately* ploughed, closely harrowed, sown with rye, and rolled—the rye was depastured in the winter and succeeding spring. Early in April the land was ploughed again; the lime and decomposed vegetable matter was thus returned to the surface. About three weeks after it was harrowed, to destroy weeds; early in May it was again harrowed for the same purpose—within a fortnight it was stirred with Beatson's Scarifier, to the depth of nine inches, harrowed, sown with

Millet, and rolled. The crop was fairly estimated at three tons per acre. After the millet was cut, the field was stirred, and repeatedly harrowed, to destroy the after growth of noxious plants. I intend to again sow rye, not only to obtain pasturage, but to protect the soil from the exhalations of the sun. In the succeeding spring, a slight dressing of fresh manure was ploughed under; the scarifier, roller, and harrow were used at intervals as before. On the 5th of May, five bushels of millet seeds were sown on four acres—on the 5th of July the crop was hauled, and estimated at four tons per acre. I have obtained this season, forty tons from sixteen acres, of which four only had been manured, the remainder could not have borne a good wheat crop. One of the loads was weighed; an account of them was regularly kept; their size was made as nearly equal as possible. I have generally used a large quantity of seed, as not more than two-thirds of that which is usually sown, will vegetate. Whilst my oxen consumed millet in its green state, they performed their work with more spirit and vigor than they had done before, or have shewn since, except when fed with grain. My cattle, of all ages, prefer it to both red and the best white clover, meadow or timothy hay.

I am not disposed to cultivate it as a farinaceous crop, since I have found great difficulty in protecting it from the ravages of immense flocks of birds, which it attracts, and in securing it sufficiently early to prevent a large part of the grain from being left on the ground. The seeds on the upper parts of the stalks, generally ripen, and fall, before those below have been filled. I therefore invariably cut it, when the upper parts of most of the heads contain seeds, which are hard. All my observations have confirmed me in the belief, that in this stage it affords fodder, more nutritious, and more easily made, than any sort of hay. The expense of tilling the land, in the accurate manner which I have detailed, is not so great as at first view would appear. A yoke

of good oxen can scarify three acres and an half, without difficulty, in one day. I would recommend millet, not merely for its value as a food, but for the means it affords of making clean the land, without summer fallows, or drill crops. The ingenious arguments which have been adduced to prove, that deep stirring between growing crops is advantageous to them and the soil, are founded upon English experience, properly directed by close attention to the effects of a moist climate. Some of our writers have profoundly asserted, that as "deep drops" are found on the underleaves of plants after deep stirring has been given in time of great drought, the practice is sound. I should suggest, if I were allowed, that moisture had better be at such times, conveyed to the roots, than be exhaled by the sun, or placed on the leaves until his rays shall have exhausted it all. The valuable parts of most manures, readily assume the gaseous form—every deep stirring, to a certain extent, in *hot* weather, therefore, impoverishes the soil. Deep ploughing, at *proper* seasons, is, I conceive, the basis of all good farming; such crops as shall enable the husbandman to extirpate weeds, and obtain large supplies of fodder, without much exhaustion, should be the great objects for his aim. I would propose that a foul sward receive its proper quantity of quick lime, which should be spread, and ploughed under, in its *caustic* state, in the early part of September; that the field be harrowed sufficiently; sown with rye at the rate of two bushels per acre, as early as possible—that it be depastured late in the autumn, and early in the spring—that in May, it be again ploughed three inches deeper than before—that it be harrowed, and left until the small weeds begin to appear—early in June, Millet should be sown—in August, the crop can be removed after the labours of the general harvest. The field should be slightly stirred with the scarifier, occasionally harrowed, and left throughout September, for the destruction of weeds as before. In Oc-

tober it may be manured, and sown with wheat, or left for a crop of Indian Corn.

I am, &c. yours,

JOHN HARE POWELL.

JONATHAN ROBERTS, Esq.

*President of Penn. Agricultural Society.*

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*To the President of the Pennsylvania Agricultural Society.*

I recommended, in the early part of the last year, the cultivation of Millet for fodder, and stated the success I had met, in its use as a food for neat cattle. I have since cultivated it much more extensively, and have been confirmed in the impressions I had conveyed, as to its management—its product—and its value, when applied to the support of horses, and black cattle, although I am satisfied, that it is not so well fitted for the use of sheep, as clover hay. The unusual drought of May and June, materially affected the growth of early sown Millet—the heavy rains in July and August injured as much in many cases, the quality of its fodder. I sowed ten acres of land in *good tilth*, with Millet, red clover, and orchard grass seeds: they were all lightly harrowed, and carefully rolled. As the success of the grass was more important, than the weight of the Millet crop, I sowed but two pecks of Millet seeds per acre, half the quantity which I am accustomed to use, where I desire a heavy crop of fodder. In despite of the injuries caused by the want of snow, during the winter, I have never had before so fair a prospect of thickly set sward. I should not adopt this practice generally since Millet must be sown so late, as to expose tender grasses, to the evils of drought in July and August, before they can be sufficiently strong to survive them.

Millet should never be grown upon land which is not in *good condition* and *very fine tilth*. The seeds should be lightly covered by a barrow with wooden teeth, and after

rolled. Of thirty acres upon which my last crop was grown, I tried various experiments. The field which was the most lightly harrowed was the most productive. I am led to believe however necessary the harrow is in all cases, to properly cover seeds, yet in few it is used with sufficient care, or in a fit shape. Excepting winter grains I know no seeds which are not I think usually too deeply buried.

JOHN HARE POWELL.

*Powelton, Phil. Co. April 10, 1824.*

To the authority of Mr. Powell we may add that of the Hon. Bushrod Washington, nephew of President Washington, and one of the Judges of the Supreme Court of the United States.

*Mount Vernon, April 14, 1824.*

“About the middle of May last I sowed about five acres of ground with Millet seed, (miliun) at the rate of about a bushel of seed to the acre.\* The ground was ploughed in a rough manner, and was in bad order when the seeds were sown, it had been slightly top dressed with barn manure some years past, and was still in good heart: the growth of the crop of Millet was rapid and luxuriant, insomuch that it attracted the attention of every person who visited the place. Intending to use the crop as hay, and finding the heads quite full of seed, and in some instances falling on the ground, I cut down, on the 16th of July, (with cradles to the scythes) four

\*In the spring of 1823, the above lot was cultivated again in Millet, (without being manured,) and produced a fine crop: in October it was sown with rye and clover, and at present promises a rich harvest. The second crop was nearly as good as the preceding summer, though it suffered much from the drought in May and June. Sheep are particularly fond of the Millet grass, but not more so than horses and other stock. The Millet seed, when ground and well bolted makes bread equally as good as the buck wheat meal. Soil that answers for grain or grass, is adapted to the growth of Millet. It may be sown at any time from the 25th of April till the 1st of August, at the rate of a bushel to the acre.

acres, leaving the Millet so cut to lie in a swarth for a few hours. In the afternoon of the same day, it was carefully turned over, and the next morning, after the dew was off, it was bound in sheaves, and in the course of the same day, it was hauled to the barn loft and put away. During the whole of this process, the weather was as fine as could be desired. The remaining acre, which was intended for seed, was cradled on the 23d of July, and left in swarth till the next day without turning it, when it was bound in sheaves, and set up in small open shocks, with the heads to the sun, till about 3 P. M. of that day, when it was hauled to the barn and packed away. The whole crop was cured of a fine green colour, and although the stalk appeared in the field to be strong and stiff, it became in a few days after it was housed, nearly as flexible as clover, or timothy.

I weighed the sheaves taken indifferently from some of the wagon loads, and in this way satisfied myself that the product of each acre was about 3500 lbs. Having entertained (from what I had read on the subject) very sanguine expectations of the product of this piece of ground, I expressed to my foreman my disappointment at this result. His observation was, that he presumed that those who had gathered larger crops had probably mowed them, whereas the stubble left on the ground, in consequence of the cradle having been used, would have added twenty or twenty-five per cent to the quantity. I then went over the field and found the stubble to be about half leg high, and in many places much taller; but the protection which it afforded to the ground, and the benefit which I presumed it would derive from being turned in for the reception of small grain, determined me in future to pursue the same mode of cutting, believing that the sacrifice of part of the hay would be more than compensated by the improvement on the land and the increased product of the succeeding crop of grain. Another advantage in cradling seems to be, that the hay, by being spread, can be more

easily removed and put away than if it were mowed and treated as timothy or clover.

The Millet cut from the last acre, on the 23d of July, was carefully threshed in the autumn, and, to my great disappointment, produced only fifteen bushels of clear good seed ; but, I then discovered from the quantity of chaff and light grains thrown away by the fan, that I had cut it much too early for seed. Had it remained on the ground until the seed were ripe, I think it highly probable that the quantity would have doubled, or nearly so. The Millet was generally from six to seven feet high through the lot, and the heads from five to six inches long, and well filled. Judge Peters says that he has raised a very fine crop of wheat on the millet stubble, when, in the same year, his crop was indifferent in the oat stubble, under the same circumstances.

On the 5th of May, five bushels of Millet seed were sown on four acres ; on the 5th of July, the crop was hauled, and estimated at four tons per acre ! I have obtained this season, forty tons from sixteen acres of which four only had been manured ; the remainder could not have borne a good wheat crop. I have generally used a large quantity of seed, as not more than two thirds of those which are generally sown vegetate. Whilst my oxen consumed Millet in its green state, they performed their work with more spirit and vigour than they had done before, or have shewn since, except when fed with grain. My cattle of all ages prefer it to both red and white clover meadow hay. All kinds of birds are very fond of it, and not more so than the different species of poultry—an invaluable food for fattening them. The seeds in the upper parts of the stalks, generally ripen first ; I therefore cut it when the upper parts of most of the heads contains seeds which are hard. All my observations have confirmed me in the belief, that, in this stage, it affords fodder more nutritious, and more easily made than any sort of hay. I would recommend Millet, not merely for its value as food,



but for the means it affords of making clean the land, without summer fallows or drill crops. Deep ploughing at proper seasons, is, I conceive, the basis of all good farming. Such crops as shall enable the husbandman to extirpate weeds, and obtain large supplies of fodder, without much exhaustion, should be the great objects of his aim. When Millet is cut down with cradles to the scythes, a considerable quantity of vegetation is left on the ground; and the general opinion is, that it is sufficient to prevent any exhaustion of the land; such has been the result of experiments by the most judicious farmers.—*New-England Farmer*.

In an article from the *American Watchman*, recommending the growth of Millet, the following is given as the product of one acre sowed with half a bushel of that seed. Three tons of hay and 30 1-2 bushels of clean seed. The hay was consumed by horses, who seemed to relish it as they would the best upland. The seed when manufactured into flour makes a cake more wholesome and equally palatable with that of buckwheat. The writer says if *one* bushel were sowed to the acre the crops would in all probability be proportionably better.—*Ibid*.

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We have thus given not all, nor perhaps one half of what might be selected as to the culture of Millet in the United States, and the success which has been *supposed* to attend it. We give no opinion on the subject *as editors*—we simply remark, that it is a fast growing plant—furnishes a great abundance of food for animals—that it is eaten by them with great readiness and even avidity—this we personally know. It is *said* to be as good a *nurse* for *grasses*, when lands are laid down as any of the grains. This we *do not* know from personal experience. But on the whole, we think it worthy of fair, extensive, and continued experiment. If it in any respect proves unworthy of permanent favour, our intelligent farmers will find it out—but if it should prove as valuable as Judge Washing-

ton and Col. Powell believe it to be, it will be a great gain to the Country, and we shall have ill performed our duty as journalists had we neglected to take this notice of it.

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SOME FURTHER NOTICE OF SOME OF THE VALUABLE VARIETIES OF NEW PEARS SENT LAST YEAR BY MR. KNIGHT TO MR. LOWELL.

WE would commence by saying, that all the original trees are alive, and in good order, except the Hardenpont de Printems, (by the French Gardeners called, Beurré Rance)—There are also living about eighty grafts from them, and a great number of buds. Mr. Lowell will cheerfully furnish buds of all the varieties, as soon as they are fit, during the present season. It must occur to every one that as the trees are small he cannot answer all the demands of the public, but regardless of the speedy growth of the trees, he will give all that can be spared without injury to them.

Of the Beurre Rance, or Hardenpont de Printems there are many grafts growing in the gardens of several gentlemen in the vicinity, for the grafts from the trees survived though the parent stock died, a case not uncommon.

Of No. V. in the catalogue of Mr. Knight's pears as printed in the Massachusetts Agricultural Repository of June 1823, the following description is given in the Transactions of the London Horticultural Society accompanied with a beautiful coloured plate of the Pear, exhibiting its form and natural size and colours.—See part IV. Vol. 4 of these Transactions.

*Extract from the Journals of the London Society.*

“Specimens of the Marie Louise Pear were received from Roger Wilbraham, Esquire, the produce of a tree in his garden at Twickenham, trained to a south wall which is however much shaded with trees. This pear which has already been noticed in the Society's Transactions, Vol. II. page 406

and Vol.III. page 120. has far exceeded any expectations which had been formed of it. Its general form is like that of St. Germain, but tapering less towards the stalk. The skin is of a greenish yellow, deepening where exposed to the sun, or when full ripe to a rich yellow, clouded with light brown russet—flesh inclining to yellow—perfectly melting, with abundance of sweet juice. The annexed figure will convey a very perfect idea of this excellent and beautiful pear. In favourable situations however, it attains to a much larger size, being sometimes five inches long, and three inches wide and weighing eight ounces. Its period of maturity is from the middle of October to the middle of November. Those received from Mr. Wilbraham having ripened one year, 17th of October, and some which were received from Mr. Knight, not till the 15th of November, but these last were produced in the climate of Downton [Mr. Knight's seat in Shropshire in the Northern part of Wales] which is very inferior to that of Middlesex (near London.) This is one of the numerous seedlings which have been raised within a few years in the Netherlands. The first specimens came from Dr. Van Mons when he resided at Brussels—and grafts and plants were obtained from his garden there, and subsequently from the Count Coloma at Mecklin. It is said to have been raised by the Abbé Duquesne, together with the Napoleon Pear already described in the Transactions, page 215 of this volume.”

Thus it will be perceived, that in this fruit we have obtained a most valuable addition to our innocent luxuries.

We shall now add the short account given in the same Transactions of the *Napoleon Pear*, and perhaps the name will give it some interest and popularity with some persons. It may make it, if it shall prove a good fruit, a little more marketable, and therefore more profitable to our friends, who raise fruit for sale.

“Roger Wilbraham, Esq. sent a fine specimen of the *Napoleon Pear*, the produce of a graft received by the Society

from Dr. Van Mons of Brussels. The form is pyramidal, but irregular, something like the Colmar. The skin is green, becoming pale yellow when fully ripe—flesh white, a little inclined to pale dull yellow, of pleasant consistence, melting and juicy, of *excellent* flavour, and much sweetness. The core is small, almost free from grit, and the seeds which are small are inserted near the head. This Pear is interesting as being the first of the new Flemish varieties produced in this country with an authenticated name. [We presume this does not apply to the circumstance of its bearing the name of the most extraordinary man of the age, but that it was the first of the new varieties which was received from an authentic source.] So *much confusion* existed in the manner in which both the specimens and grafts were sent over by Dr. Van Mons that it will be a work of considerable attention to affix the original names to the produce of the trees now abundant in the gardens of the members of this Society, who have attended to the growth of *these valuable* fruits, which the *industry of the Flemish gardeners* have recently acquired."

It will be seen by this extract, that the *Napoleon Pear* is also excellent. They have omitted in this account, the season of its ripening, but Mr. Knight in his letter to Mr. Lowell published last year, states it to be November, and December, which much enhances its value.

When we consider the high state of Horticulture in England and the just pride in it—and the natural jealousy they would feel in having their near neighbours across the channel surpass them in producing new and excellent fruits, we have abundant reason to believe that those new Flemish varieties raised from seed are highly valuable.

The concluding remark in the notice of this pear as to the *confusion of names of different fruits* induces us *once more* to beg cultivators to be more attentive to this subject, and to strive as far as possible to give the correct names, the *authorized, admitted* names to every fruit tree they possess. It is

a matter of far greater moment than gentlemen are aware of. One man finds he has a fine fruit. He calls it a Virgouleuse, when in truth it is a Colmar. He recommends it to his friend as a Virgouleuse. His friend not having *that* pear, takes grafts from it, and waits five years for its fruit, when to his great mortification, and severe and irreparable loss, he finds it to be nothing but a fruit of which he had *too much* before, under the true and correct name of Colmar. Disappointed and vexed, he has no resource, but to graft the tree anew, and perhaps a second excellent and obliging friend has unwittingly deceived him a second time. It is a very serious evil in Horticulture, and demands the most strict attention. We shall never make the advances we might make in this branch while we are so careless about names. It is not indeed difficult, even for unlearned persons, to ascertain *the facts*. Let them never graft, till they have seen *the fruit*, and submitted it to those who are judges; or, at least, let them not take their scions, except from well informed cultivators.

#### *Seckle Pear.*

It may be interesting to some of our readers to know what the best cultivators in Europe think of the best, if not the only superior new pear produced in America. It is admitted, we believe, by the French and English gardeners that the Seckle Pear is *new* to them. We know that General Moreau pronounced it to be new to the French. They consider it an American production. That we have had no more new varieties is undoubtedly owing to our inattention to the subject. Even this justly celebrated Pear was the produce not of care but of accident. We have been informed that Mr. Johonnot, of Salem, has attempted with laudable industry and enterprize, to raise new varieties of the Pear from the seed; and that he has succeeded in producing one excellent variety. Cultivators ought not to be discou-

raged because so few are found to reward their labour. Dr. Van Mons of Brussels raised *eight hundred* new varieties, of which only 30 were deemed worthy of cultivation. But the labour is by no means lost; the stocks are highly valuable, and may be grafted with better fruits. In this vicinity, we have learned that fruit trees are the most valuable products of the soil, and we know instances where an acre filled with good trees in a bearing state would sell, and has been sold, for 500 dollars, when the same land stripped of the trees, would not sell for 150 dollars.

*Transactions of the London Horticultural Society.*

“John Braddish, Esq. sent specimens of the Seckle Pear, the produce of Espalier trees in his garden. The fruit has been already described in the Transactions of the Society from a drawing made in America and received from Mr. Coxe of New Jersey. It is gratifying to find that the present specimens, *though larger*, closely resemble the figure published with the account, and fully justify the *high character* given of the Pear by Dr. Hosack (of New York) in the paper alluded to. In shape it resembles the Swan’s egg, but is a little longer. Skin of a greenish olive colour, often with much dull or bronzed red on the side exposed to the sun—flesh yellow, very fine in texture, melting, juicy and sweet, with a delicate and very *powerful bergamot perfume*. It is in this *perfume* that the *Seckle Pear differs from all others*, and which has caused it to be so highly extolled in America.

“The Society having received by the kindness of Dr. Hosack, a number of plants of the Seckle pear in 1819, distributed them to the nurserymen around London. It is therefore expected that young plants for sale are by this time plenty.”

So far, say the English horticulturists. *We add*, that it is by such interchanges of blessings peculiar to each country,

that the enjoyments of all are increased, and we know of nothing more delightful than such an intercourse. It atones in some small degree for the evils which the ambition and ill passions of men inflict on each other. We take this occasion to say to our country friends who have not been familiar with this excellent American pear, that it is worthy of their attention. It is hardy—a great bearer—ripens at a time when they are destitute of fruit. It bears very young—very constantly; and would, if no other fruit could be obtained, of itself furnish a delightful dessert. Nothing can surpass its exquisite flavour. The writer of this article will be happy to furnish grafts in the month of March, or buds in July, to any agricultural gentlemen, if they will send to his place in Roxbury.

We shall take some notice of another new pear, because it has been introduced by one of the Trustees of this Society, and a most distinguished cultivator of fruits, S. G. Perkins, Esq. It was received from the Garden of the London Horticultural Society.

“*The Charles d’Autriche Pear.*”

It was probably so named from the celebrated Archduke of Austria, who was the most successful combatant of Napoleon, before Wellington arose to eclipse him, or at least to diminish his lustre.

“This is a large variety three inches and an half long and three inches wide. It is one of the *new* varieties sent by Dr. Van Mons. Skin greenish yellow, profusely sprinkled with brown spots and partially russeted. Flesh melting, white, very juicy, with a rich high flavour, but with little if any perfume—a *beautiful* and *fine* fruit. Ripens about the middle of November.”

We hope we shall be pardoned for devoting so much of our Journal to fine fruits.

## A GEOLOGICAL AND AGRICULTURAL SURVEY OF RENSSELAER COUNTY, STATE OF NEW-YORK. [BY AMOS EATON.]

[From Memoirs of the Board of Agriculture of the State of N. York.]

[We are induced to insert the Geological Survey of Rensselaer County in the state of New-York, to exhibit some idea of what we propose should be attempted for every county in this state. (See article first in this number on the importance and practicability of Agricultural Surveys of our several Counties.) We hope there are talents and zeal enough to furnish such statements. We give no opinion as to the merits of the execution. It is out of our sphere to be critics of Agricultural works. We hope that the interest which should be felt in the subject will excuse our devoting such a portion of our work to this Survey.]

*To the Honourable STEPHEN VAN RENSSELAER, Esq.*

IN taking a Geological and Agricultural Survey of Rensselaer County, I have pursued the method adopted in the County of Albany last year by Dr. T. Romeyn Beck and myself, in most cases. My enquiries in relation to the *Methods of Culture*, have, in this county, been more particular than those made by us in Albany County. In this department I have endeavoured to meet your views, by collecting materials for a kind of Agricultural Calendar, to direct the young and inexperienced farmer in regard to times of sowing, planting, harvesting, &c. as well as the most approved methods for preparing his ground. Theoretical treatises on agriculture are found in abundance on every bookseller's shelves; many of which are rather calculated to perplex, than to instruct, the practical agriculturist. I have endeavoured to carry your instructions into full effect, by rejecting all theory, and by preparing a concise system founded wholly on the experience of the labouring farmers of Rensselaer County.

Though I did not converse with every farmer in the county, I called on one, at least, in every neighbourhood in all



the towns; and I wrote down, in his presence, the methods of culture adopted by himself, and by his neighbours as far as had come to his knowledge. By this method I believe I have collected, and brought within a small compass, most of the *practical* agricultural knowledge of the county, which it will be advisable to publish.

I did not confine myself to crops of grain and grass; but I extended my enquiries to the subject of orchards, kitchen gardens, shrubbery, cattle, horses, sheep, swine, &c.

In my arrangement of materials, I follow the Albany County method, excepting the article, Method of Culture. This article I have separated from that which is strictly geological; and have been very particular to divest this part of the report of technical obscurities. As you intend this exclusively for the benefit of the labouring farmer, I have rendered it in the style of the farmers, from whom I received it.

With the ardent hope that my efforts may not have fallen short of your expectations, and that the following report may be useful to those for whom it was intended,

I subscribe myself,

Your grateful humble Servant,

AMOS EATON.

Troy, Dec. 17th, 1821.

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#### GEOLOGY

##### OF THE COUNTY OF RENSSELAER.

THIS county, and the county of Washington on the north, and of Columbia, on the south, are chiefly of the transition formation; and this county in particular, has heretofore been considered as *wholly transition*. But I found a small tract of secondary formation in the town of Schaghticoke, about four miles east of the Hudson; and was conducted to a similar tract by the President of the Agricultural Society of the

county, in the north part of Greenbush. This formation is decidedly the compact, or secondary lime rock, reposing on graywacke. The former tract is situated on a farm of the Hon. G. Tibbits, occupied by John Button, one mile west of the Hon. H. Knickerbacker's, on the north side of Tomhannick creek, the latter is five miles, in a southeasterly direction, from Troy. Whether the argillite, or slate rock, along the eastern margin of the county, belongs to the transition class, is not yet agreed among geologists. Bakewell, and some other respectable European authorities, would place all our argillite under the transition formation. But the celebrated Werner, Professor Silliman, Dewey, and others, would class the eastern range of argillite, which limits the county, with primitive rocks. It is certainly separated from the argillite of the west part of the county, throughout the whole extent, by a continuous north and south range of well characterized metalliferous limestone; and it agrees in character with the European specimens of shining argillite.

There are difficulties, however, attending this arrangement. Equally well characterized metalliferous, or transition limestone, is to be found on the east side of this range of supposed primitive argillite throughout its whole extent. And shining argillite is to be found, at different intervals, either alternating with, or embracing extensive beds of transition limestone, within five miles of the Hudson; where most of the argillite is decidedly transition, and embraces marine organic relics.

Under every view of the subject which I have taken, and I have devoted much time and attention to the enquiry, I am not yet inclined to follow those geologists who admit a stratum of primitive argillite in the Northern States. For although there are difficulties in the way when we rank the shining argillite with transition rocks; still greater difficulties present themselves, if we denominate it primitive, according to any definition hitherto given of that class. Excepting the

talcose glazing in the natural cleavages, there is nothing in this rock of that glimmering character which is so striking in primitive rocks. The transverse fracture of shining argillite is as earthy and destitute of lustre as any of the transition classes. This, I admit, is not a conclusive argument; but this general appearance of rocks was taken into consideration by Werner himself, when constructing his system. A semi-crystalline character, especially in the aggregated constituents, he seemed to consider as essential to all primitive rocks. Excepting talcose or soapstone rocks, I believe there is no exception. And even this kind of rock is the same in substance throughout, or nearly so, as the glazing which gives the lustre to the shining argillite.

That all adjoining strata, especially in the same class or formation, pass into, and alternate with each other at their adjoining sides, is a fact well known to every practical geologist. It is well known also, that as far as these alternations continue, the alternating rocks, however distinct at distant points, here assimilate in some of their characters. If we say that the true place for the metalliferous or transition limestone is at the west margin of the primitive granular limestone, (or Berkshire range of statuary marble,) and that it alternates several times with the transition argillite, we shall be involved in no inconsistency.\* The slaty form which the transition limestone assumes, its accommodating the position of its tables to that of the argillite, will then no longer appear as an anomalous formation. Anomalies are odious in any science; and their admission in any department of the science of nature, is a most emphatical admission of our ignorance.

There are, in the county, several fields and small patches of the true *old red sand stone* of Werner, resting on graywacke.

\* A different arrangement was adopted in the Index to the Geology of the Northern States; which I think ought to be so corrected as to bring the granular and metalliferous limestone together.

One considerable field of it is situated in Nassau, on the west face of a hill, half a mile south of Dr. W. C. Elmore's store. Several patches of it are to be seen in Grafton and Sandlake.

This rock is similar to the red sandstone of Catskill mountains and their extensive spurs. It is not brittle or friable like the breccia\* of Connecticut river. And though marine relics, especially corallines, are frequently found in it; dry land organic remains, such as those found in the breccia of East Windsor, in Connecticut, and of Nyac, in New-Jersey,† are never found in it.

A more extended discussion of these subjects would be inconsistent with the object of this survey. I will therefore say in short, that I consider the county of Rensselaer wholly of the transition formation, with the exception of the very limited localities of secondary limestone, or compact limestone in Schaghticoke and the north end of Greenbush, before described. And that all the regular strata of the county should be classified in the following order: Metalliferous limestone, Argillite, Graywacke, Red sand-stone—the last of which has almost disappeared.

There are in the county three principal ranges of rocks extending in a northerly and southerly direction. First, the rock forming the basis of Williamstown mountain, along the east bounds of this county, consisting wholly of argillite. Second, the rock forming the basis of Little Hosick valley, extending the whole length of the county. At the south part of the county it approaches very near to the east boundary; diverging from it northerly, it becomes about four miles distant. The basis rock is one continuous range of metalliferous limestone. Third, the basis rock of what is called Petersburgh mountain. This range extends from the south bounds

\* The name breccia, or brittle, was applied to that rock by Werner, because brittleness or friability is its most distinctive characteristic—particularly distinguishing it from the red sandstone.

† See Ackerley's *Geology of Hudson*, p. 35.

of the county, to within about five miles of the north. Its most elevated part is near the middle of the county ; and it subsides into moderate hills both to the north and south. Its eastern side is abrupt and often precipitous ; its western side slopes off more gradually to the margin of the Hudson. The basis rock, throughout this extensive range, is graywacke, reposing on argillite. The rock in view on the highest parts is the coarsest rubblestone variety ; on the less elevated parts, slaty graywacke ; and on the lowest parts the argillite appears. Consequently along the western side of the Little Hosick valley, and along the banks of the Hudson, argillite is the principal rock in view.

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#### TRANSITION FORMATION.

##### METALLIFEROUS LIMESTONE.

The metalliferous limestone is intermediate in its external characteristics between the granular (from which statuary marble is taken) and the compact. It is somewhat difficult to give a definition of this rock, which shall be sufficient to distinguish it from the granular, in the state of hand specimens. It is often made up of glimmering grains like the granular ; but the grains are more indistinct, and a fresh fracture presents a more earthy appearance. It is also more variegated in its colours, and often slaty. When examined in the large rock it may perhaps always be distinguished from the granular by the veins of calcarious spar with which it is traversed. I have never discovered such veins in lime rocks unequivocally primitive.

This rock abounds in valuable ores in some countries. In South America the richest silver mines are found in this rock. But no important mines have been found in it in North America ; unless the lead mines beyond the Mississippi may be supposed to have been originally imbedded in it.

In coming from the primitive Green-mountain range west-

erly, we first fall in with the metalliferous limestone at the westernmost side of the granular. It runs along, forming the basis of a valley, mostly a little to the east of the east bounds of this county, throughout its whole extent. A range of argillite is then interposed, on which runs the east line of the county, forming a high ridge or mountain, two or three miles in width. Then the metalliferous limestone occurs again, forming the basis rock of a north and south valley, extending the whole length of the county, as before described. On the west side of the valley it passes beneath the argillite.

It seems to alternate with the argillite several times more between the valley of the Little Hosick and the Hudson; but as I could never succeed in tracing these alternations to any considerable extent, perhaps it may be more proper to denominate them extensive beds.\*

#### SUBORDINATE ROCKS.

*Transition granular quartz, or Transition sandstone.*—These names are not authorized by any adequate authority. I use them here from the necessity of the case. If the rock I intend is known by any other name, I will cheerfully relinquish these, and substitute such older name. It differs from the primitive granular quartz by the more hyaline or glassy appearance of the grains. It seems to be to the metalliferous limestone what the primitive granular quartz is to the granular. It is not so abundant, but it is almost as constant an attendant on the metalliferous limestone as the granular

\* The distinction between *beds* and *alternating layers*, is often over-looked. For example, the serpentine in the Milford marble quarries is in beds; because it is interposed between the layers of limestone, and is of limited extent compared with the limestone, being terminated by the approximation and final contact with the layers. Whereas the granite embraced in the gneiss at Chesterfield, Mass. is never in beds. It appears either in veins traversing gneiss; or it is in layers alternating with it, which appear to be co-extensive with the layers of gneiss. At least we are unable to shew in any case, that the one extends beyond the limits of the other.

quartz is on the granular limestone, from Whitehall on Lake Champlain, to Barnagat on the Hudson. In both cases the grains of quartz and limestone often become intimately blended; and sometimes in such proportions, that it is difficult to draw the line of distinction.

It is a remarkable fact, that carbonate of lime, in all its geological positions, is accompanied by silicious formations. Primitive limestone is connected with primitive granular quartz—Transition limestone with transition granular quartz—Secondary limestone always abounds in hornstone, a highly silicious mineral. And on the Eastern continent, the chalk beds contain nodules of flint in abundance.

#### ARGILLITE.

Argillite is the proper slate rock, or the soft slate, as it is denominated by farmers. The position of the laminæ or tables, constituting this rock, has long excited the attention of curious observers. I shall not enter into any discussion relative to Bakewell's suggestion, that it may be the result of that general crystalline tendency, which pervades the mineral kingdom. But I will describe the rock, according to the facts which have fallen under my observation.

This rock is composed of slaty laminæ or tables, standing transversely to its general direction, so as to form angles between 45 and 80 degrees with the plane of the stratum. In the Northern States the laminæ lean towards the west and north west. The best illustration of this formation to which I am able to refer, is to be seen along the west bank of the Hudson, a little north of Newburgh, in Orange county. Several oblique layers of this stratum, lying one upon another, there present themselves as before described.

In my survey of Rensselaer county, I observed, that the laminæ became more nearly horizontal as I approached the primitive range of New-England. When this fact first presented itself, its accordance with a very flattering theory was so striking, that I did not trust to one course of observations.

I crossed the county in three nearly parallel lines, not less than six miles distant from each other in any part, and witnessed the same uniform variations on all the lines. I discovered that the inclination towards the horizontal position did not depend on elevation. For though the laminæ in Williamstown mountain were more inclined towards a horizontal position, than they were farther west; the same inclination was still more increased in the valley east of the mountain.

The range of argillite forming Williamstown mountain, separates the two ranges of metalliferous limestone before described, four or five miles from each other, from near the south bounds of the county, as far north as the junction of the Hosick river with the Little Hosick. Here the two lime-rock ranges approach each other, and the mountain subsides into irregular hills and plains. The same ranges of rocks hold on their northerly course, regardless of the varying surface of the county. Here the laminæ begin to be remarkably strait, and split into excellent roofing slate. Moses Warren, Esq. has wrought two quarries of this slate with great success in the town of Hosick for several years. Other valuable quarries have been wrought still further north. We have good reason to believe that such quarries will be frequently discovered along the whole course of this range, in the county of Washington, &c. For it appears from the observations of geologists, made in various parts of the earth, that a continuous range of any rock is remarkably uniform in its character, in its enclosed minerals, &c. *when examined at nearly the same depth.* To apply this principle, we should look for good slate in all places of about the same elevation with Mr. Warren's quarries along the same range in Washington county, between the same two ranges of metalliferous limestone. We should not expect to find good quarries far to the south, because the same elevation would bring us near the base of Williamstown mountain.



After passing over the lime-rock range of the Little Hosick valley, we find a north and south range of argillite extending through the county. It passes under the graywacke generally before we arrive at the top of Petersburg mountain, throughout the towns of Petersburg and Berlin, and in the northern part of Stephentown. In the south and north extremities of the county it appears at different intervals all the way to the banks of the Hudson. This range affords no slate quarries that have yet been wrought near its eastern edge; but a quarry has recently been opened in the city of Troy, by Stephen Ross, Esq. which seems to promise great advantages.

Although the slate range west of Little Hosick valley may be satisfactorily traced to the Hudson, and demonstrated to be the same continuous rock; still it becomes a very distinct variety immediately on the bank of that river, which will be described as a subordinate rock.

Wherever argillite occurs in the county, it is traversed by veins of milky quartz. These veins are most abundant and largest towards the eastern part of the county. Here chlorite (a beautiful green mineral made up of minute scales) is attached to the quartz in great quantities, and often imparts its colouring matter to the quartz. The slate itself is greatly variegated in its colours. Blue, red, purple, grey, and silvery, are the most prevalent hues of the Williamstown mountain slate.

I found no ores in this stratum, excepting the sulphuret of iron. Reports have long prevailed that copper ore exists in great quantities in Williamstown mountain. These reports excited my particular attention; and I was so fortunate as to be introduced to the principal *alchymist*, who is the neighbourhood oracle on that and other mysterious subjects. I found his copper ore to be nothing more nor less than very beautiful chlorite.

## SUBORDINATE ROCKS.

*Glazed Slate.*—This has been sufficiently described in the report of the geological survey of Albany county. The most remarkable locality is that through which the commissioners are now cutting the canal at the Old Bank Place in Troy. The glazing is as dark and shining as the most beautiful japan varnish. Sometimes it becomes a bottle green, and even a grass-green. On blasting, the rock flies into thousands of the most beautiful jet black lenticular forms, perfectly glazed on all sides. Their surfaces are often sprinkled over with extremely minute cubical crystals of iron pyrites of a golden lustre.

Notwithstanding the natural cleavages, the colour, texture, &c. of this rock, differ so widely from that which is now quarried by Mr. Ross, it may be traced every foot of the way, and demonstrated to be the very same continuous rock. The glazed slate occurs at intervals on the banks of the Hudson not only through the whole extent of this county, but as far north as Fort Miller, in Washington county. It gives rise to several very strongly charged Harrowgate springs.

*Silicious Slate.*—This rock appears in alternating layers, tables, or in beds, near the bank, and in the bed of the Hudson, throughout the county. I know of no beneficial use to which this rock has been applied.

*Alum Slate.*—There is a layer of this rock embraced in the bank of argillite near the mansion-house of the Hon. George Tibbits, in Troy. But it does not appear to be of great extent. About half a mile beyond the south-east corner of the county, within the town of New Lebanon, there is a remarkable locality of alum slate. The manufacture of alum might, in my opinion, be set up at that place to great profit.

## GRAYWACKE.

This coarse gray rock forms the basis of more than half

the county. It is perfectly insulated, and lies upon the argillite like a huge turtle upon the beach; its back forming the middle and elevated part of the county. Although the same rock forms the basis of a large proportion of the adjoining counties on the north, south, and west, it does not extend unbroken, into either of them. It becomes thinner on all sides, and at length leaves the argillite bare on the north, west, and south. On the east side it terminates abruptly below the brow of the hill which bounds the valley of the Little Hosick on the west.

Wherever the graywacke rests immediately on the argillite, it is the slaty variety, and takes on the form and position of the argillite. A very perfect example is to be seen on the turnpike road half a mile west of Nassau village. And the two rocks often pass into each other by such imperceptible gradations, that it is difficult to fix upon the dividing point. Very good samples of this kind may be seen at the junction of the Hosick and Hudson rivers, at Waterford bridge, and along the road at and above Mr. Tibbits's. Though graywacke slate is generally of a grey colour, it is found of a sky-blue colour in many places, and sometimes brick-red. There is a limited locality of the latter colour on the line between Troy and Brunswick, on the Sandlake road.

On ascending the hills, we find the fissile slaty variety of graywacke giving place to the more compact; and its colour becoming more blue and greenish. Quarries of this variety have been wrought by Mr. D. Buel, Mr. A. Gardner, Mr. R. P. Hart, and others, in Troy, Brunswick, &c. for several years. It makes excellent building stone, when applied to places not exposed to heat. It has been sawed and so wrought as to form beautiful blocks for the basement story of some of the best houses in Troy. Farther east, in the interior of the county, as in Grafton and Sandlake, we find the beautiful green and blue varieties very abundant. But on ascending the higher hills of those towns, the only rock,

in place, which presents itself, is the coarse rubblestone variety of graywacke ; which will be treated as a subordinate rock.

I found no organic relics in the graywacke of this county. In truth, I have not been informed of the discovery of any organic remains in this county, excepting the *orthocerite* in the argillite of Troy, and the *terebratulite* in the secondary limestone of Schaghticoke. Very thin and limited beds of anthracite have been found in graywacke in various places in the vicinity of the Hudson, particularly at Schuyler's quarries in Troy. Iron pyrites is frequently found in this, as in the other transition strata. It is said that sulphuret of lead has been found in it in this county also ; but the fact seems not to have been well authenticated. I was shewn some of the lead ore, and found it to be attached to pieces of graywacke rock ; but from the best evidence I could procure, it seemed probable that it was brought from Columbia county.

#### SUBORDINATE ROCKS.

*Rubblestone.*—This rock has formed a subject of some discussion. It puts on so many appearances that it has been a source of much confusion, when studied in the state of hand specimens. It has also afforded opportunity for closet speculators and some of our ephemeral reviewers, to display a degree of ignorance equalled only by their impudence.

There are numerous localities in the towns of Grafton and Sandlake, where this rock, in a single continuous and unbroken field, presents the green graywacke, the coarse granulated variety, the porphyritic variety which is speckled with felspar, and that variety which has the appearance of puddingstone. I examined vast rocks of the compact blue and green graywacke, which embraced within their most solid parts, large masses of an aggregate in all respects resembling the common puddingstone : excepting that the cement was chiefly aluminous. In our district of country, the pudding-

stone cement is carbonate of lime of oxyd of iron ; and it is always insulated, forming a genuine alluvial rock. Whereas our rubblestone variety of graywacke, like that which is so abundant near Boston, is firmly established in its connexion with other rocks.

I did not find any very good locality of *hone slate* or *grit sandstone*. But such rocks frequently occur in limited patches in various parts of the county.

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#### ALLUVIAL FORMATION

##### GEEST.

This kind of soil, being formed from the immediate disintegration of parts of the existing rocks, partakes of the nature of the argillite and graywacke in a large proportion of the county. Such is the rapidity of the dissolution of argillite, that farmers denominate the geest overlaying slate rocks, their slaty soils. Col. John Carpenter, of Hosick, has a farm, whose basis rocks are argillite and graywacke slate. Ten or twelve years ago several of his fields were chiefly made up of bare rocky knolls. Now most of these knolls have become good arable land. It has been his practice, especially since cast iron ploughshares came into use, to drive his team across these knolls when ploughing the adjoining grounds ; and thus to break up at every ploughing a little of the exposed parts of the rock. In a few years these broken fragments became good soil.

Col. Carpenter found that the graywacke slate which capped his highest hills, required more time and made a more silicious soil. The soil immediately formed from it is mostly of the granulated kind ; but it becomes more loamy in a few years.

Dr. N. B. Harris, of Sandlake, and Gen. M. Moffitt, of Stephentown, have observed the same process of disintegration and rapid formation of soils on their respective farms.

And almost every farmer, whose land is situated on slate hills, has observed that his soils are yearly becoming deeper and better. Even where the underlying rock is graywacke slate of the brittle fissile variety, the same process of disintegration is observable, though its progress is less rapid.

#### ALLUVION.

This formation presents some of the most interesting phenomena, which are connected with the natural history of the earth. The more ancient alluvion, which was probably formed while the ocean stood over our continent, never embraces any leaves, timber, or other vegetable substances. The recent formations of alluvion always embrace numerous vegetable substances, which belong to species now found growing in the same district. That part of the city of Troy, which is situated between the river and hills, belongs to the recent formation of alluvion. Well-diggers always find at a great depth, abundance of branches, leaves, &c. of the hemlock tree, (*pinus canadensis*), and of other trees now growing in the immediate vicinity.

The order of the layers in both the primary and secondary alluvion, seems hitherto to have eluded the science of classification. It is very probable that future observations may enable geologists to establish a system of arrangement in this department of nature. I will here contribute my mite, by giving one locality. On the rock of glazed argillite in which the canal at the Old Bank Place in Troy is cut, the alluvion presents the following layers:—1st. One foot of loam at the surface. 2d. Four feet of coarse gravel. 3d. One foot of good building sand. 4th. Three feet of clay marl, containing 15 per cent. of carbonate of lime. 5th. Coarse sand, striped horizontally with black, which rests on the rock.

We are not acquainted with any established rule for determining, from an examination of the soil, what timber trees

grew upon it originally. The trees, as well as other plants, vary greatly on the same piece of ground at different periods, under different circumstances. For example, the dense forests of evergreens, consisting of the hemlock tree, (*pinus canadensis*,) the three kinds of spruce, (*pinus. alba, nigra, and fraseri*,) the fir tree, (*pinus balsamea*,) on the western declivity of Catskill mountains, are succeeded by the black birch, (*betula lenta*,) and wild cherry, (*prunus virginiana*,) if the ground is neglected two or three years after the first clearing. Similar facts have been stated to me by several farmers in Rensselaer county.

Notwithstanding this variation in the natural productions of soils, some rules may be adopted in regard to this subject. 1st. Sandy alluvion invariably produces the pitch pine, (*pinus regidus*,) wherever it occurs in this county. 2d. Clay soil in low situations produces the white oak, (*quercus alba*,) and pin oak, (*quercus palustris*,) and sometimes other species of oak. 3d. Loamy soils resting immediately on the hardpan, uniformly produce the beech tree, (*fagus ferruginea*,) and the sugar maple, (*acer saccharinum*,)

From the south bounds of the county to the city of Troy, run nearly parallel to the Hudson, two ranges of alluvion. One is clay alluvion, being from one to two miles in width, and from the fourth to half a mile distant from the river. The other is sandy alluvion, being from one to two miles in width, and lying immediately adjoining the clay range. Where these two ranges meet, an excellent strip of land, being a due mixture of sand and clay, is formed, about half a mile in width. Much clay marl, yielding from ten to fifteen per cent. of carbonate of lime, is embraced in this range. The clay range approaches the river as it proceeds northerly, and forms most of the first hill back from the bank of the river. And it continues pretty uniformly throughout the county.

On the river side of these ranges the soil is mostly gravelly loam or river alluvion. In some places clay flats are

formed. On the eastern side commences the yellow loam, often very gravelly, which forms at the least three fourths of the soil of the county. In some places it contains so much clay as to be denominated *clay loam*, in other places it should be called *upland loam*.

#### MARL BEDS.

There is an excellent bed of marl on the land of Jacob Sharp, near the northwest corner of the town of Sandlake, six miles from Troy. I examined it in company with the President and Secretary of the agricultural society; and we judged the quantity to exceed that of any bed of the kind either of us had hitherto examined. Its depth and extent exceed any of those which we examined in Albany county, and it appears, on analysis, to be equally rich.

Mr. Thomas Cole told us, that the bottom of the pond on Aaron Vandercar's land, half a mile south of Sharp's marl bed, consisted of a bed of similar marl. This he had ascertained by sounding it with long poles. This pond might be drained without great expense; and while it would afford marl to the neighbouring farms, would itself become rich bottom land.

It is a remarkable fact, that all the marl beds in Albany county, and in Rensselaer county, are surrounded by that kind of loose gravelly soil, which is most benefitted by the application of this kind of calcarious marl: while the sandy pine plains in both counties are every where underlaid with, or in the vicinity of, inexhaustible beds or layers of clay marl, which is the best of all manures for that kind of soil.

In the town of Scaghticoke, in connexion with the secondary limestone, near the Tomhanick, before described, there is a kind of shistose marl, or rather argillaceous limestone, which serves as an excellent manure for the surrounding gravelly farms. It is readily disintegrated on exposure to air and moisture. It contains forty per cent. of carbonate of



lime, and being combined with clay, it possesses, for all agricultural purposes, the properties of very good marl.

#### COAL AND PEAT.

This county being almost wholly of the transition formation, we have no reason to believe that a coal bed will ever be found in it. Thin layers or beds of anthracite, or glance coal, are frequently found in the rocks of graywacke slate. I have seen those layers in Schuyler's quarry, about an inch in thickness.

Considerable money has been expended in digging for coal in Greenbush, in the glazed slate. Inexperienced persons were deceived by the black colour of the slate. Such enterprising individuals ought to know, that as iron pyrites and yellow mica are not gold,—for “all is not gold that shines;” so the black slate of Greenbush, and the shorl near Lake George, are not coal,—for all is not coal that is black.

Peat can hardly be said to have been discovered in this county. Though several swamps and boggy fens seem to contain the materials for peat to great depths. But the vegetable matter seems not yet to be sufficiently decomposed, nor to be sufficiently charged with bitumen.

#### ORES.

Loose masses of hematitic iron ore, similar to that of Salisbury mines, in Connecticut, are frequently found along the Little H sick range of metalliferous limestone.

A mixed ore consisting of oxyd of manganese, oxyd of iron, carburet of iron, and, I believe, carbonate of iron, frequently occurs in various parts of the county. It appears in situations resembling bog ore formations. The principal locality is on the lands of C. R. Colden, Esq. in Pittstown. Similar formations appear in Hillsdale, Columbia county; Blenheim, Scholharie county; and in other graywacke districts.

## SALTS.

In our survey of Albany county, we mentioned the efflorescence of epsom salts, on the clay banks in Coeymans. There is a similar locality three miles north of the village of Lansingburgh, on the farm of Judge Hickock. It oozes out from the clay bank of the Hudson, and becomes a very thick efflorescent crust in dry weather. In quantity it greatly exceeds that produced at Coeymans. In truth, it is formed so fast, that I believe a method might be adopted for collecting it so as to render it a source of profit.

## MINERAL SPRINGS.

Sulphur springs, or waters charged with sulphuretted hydrogen, issuing from the glazed black slate, are very abundant on both banks of the Hudson, from Fort Miller to the Highlands; a distance of about one hundred and thirty miles. The Greenbush sulphur springs are well known as being more highly charged than perhaps any spring of the kind in this district. One of these springs is opposite to Albany, and the other is about three miles south, near the country seat of Mr. Genet. There is a similar spring issuing from the same range of black glazed argillite, almost as highly charged, near the Old Bank Place, at the north end of Troy. Other sulphur springs, of different degrees of strength, occur in various parts of the county.

The most remarkable springs in the county, are the nitrogen springs, in the northeast corner of the town of Hosick. They are on the farm of John Bratt, six miles southwesterly from the village of Bennington, in Vermont. There are three springs comprised within about four or five acres of ground. The quantity of pure nitrogen gas, or azotic gas, which issues in the form of bubbles from these springs, is incalculable. The gas does not seem to be combined with the water, but to issue from the gravel beds beneath the water of the springs. And we have no good reasons for say-

ing that the gas is confined to the beds of these springs. It may continually issue from the dry parts of the soil in their immediate vicinity, and become manifest only where the water covers the soil, by bubbling through it. By pressing upon a surface of the gravel, equal to five or six inches square, a quart of the gas may be collected in an inverted jar or bottle, in ten seconds.

By what process in nature is such an abundance of nitrogen gas incessantly produced? This is an enquiry which, in the present stage of human knowledge, will confound the geologist and the chemist. About three-fourths of the atmosphere is nitrogen gas; and we are acquainted with no other extensive reservoir of this substance. If it is derived from the atmosphere, how is it introduced into this situation? Or, if this process of nature should be explained, how is the oxygen of the atmosphere separated from the nitrogen?

The wells and springs near the Hudson, are, almost without exception, more or less charged with muriate of lime. The springs in the interior and more hilly part of the county, contain less of this salt; and in some of them we could not detect any of it. The nitrogen springs, or rather the springs through which the nitrogen gas issues, are very highly charged with muriate of lime.

# SYNOPTICAL VIEW OF SOILS.

*The Soils of Rensselaer County analyzed and classified from average Specimens, with their General Constituents subjoined.*

CONSTITUENTS.	1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th.	9th.
	IRANCIATED SOIL.	UPLAND LOAM.	UPLAND CLAY.	LOWLAND LOAM.	CLAY LOAM.	SANDY ALLUVION	RIVER ALLUVION	LOAMY ALLUVION	CLAY ALLUVION
Silix, . . . . . Alumine, . . . . . Carbonate of Lime, . Soluble Salts, . . . . Animal and Vegetable Matter, Water, . . . . . Oxyd of Iron, . . . .	70.5 21.5 0.0 0.0 5.0 2.5 .5	65. 22.75 1.25 1.5 5.5 3.5 .5	62.5 26.0 0.0 2.5 5.0 3.0 1.0	64.0 21.0 1.0 1. 9. 3. 1.	63. 24.5 0.0 2. 5.5 3.0 2.	87.5 6. 0.0 0.0 4. 1.5 1.	57.0 20.0 4.5 2.0 12.5 3. 1.	68.0 18.0 1.0 .5 8.5 3.0 1.	42.0 39.0 2.0 2.0 5.0 3.0 1.0
Alumine settled	100.0	100.0	100.0	100.	100.	100.	100.	100.	100.
	in $\frac{1}{4}$ hour.	in 1 hour.	in 12 hours.	in 2 hours.	in 5 hours.	in $\frac{1}{2}$ hour.	in 1 $\frac{1}{2}$ hour.	in 1 $\frac{1}{2}$ hour.	in 26 hours.

## METHODS OF CULTURE,

*Or, An Agricultural Calendar for Rensselaer County.*

## GENERAL OBSERVATIONS.

The most general rotation method of crops, adopted in this county, where the land is warm, loamy, or sandy, containing but a small proportion of clay, and not mountainous, or very greatly elevated, is as follows :—

1st. *Winter Wheat*, sowed about the middle of September, after ploughing up sward ground in the heat of summer, either June or July, and cross ploughing twice.

2d. *Indian Corn*, planted about the middle of May, after the stubble had been twice ploughed, and furrowed the same spring.

3d. Some kind of *Spring-Sowed Crop*, as oats, barley, peas, flax, spring-wheat or spring-rye, sowed in the month of April, after the corn hills had been twice ploughed and harrowed.

4th. On the last mentioned spring-sowed crop, immediately after sowing, sow *Clover* and *Timothy Grass*. This crop is either mowed, or pastured, until three or four years from the time the seed is sown; then it is broken up, and wheat sown again as before. (W. Canfield, J. Wilson, S. R. Campbell, W. Jaques, W. Fitch, S. Hitchcock, S. Griffith, J. Phillips, R. Rogers, N. B. Harris, H. S. Vandercook, M. Warren.)

Where the land is clay loam, or the common yellow loam, underlayed by hardpan, or land subject to be overrun with quack-grass, or noxious weeds, the most common rotation method in this county is :—

1st. *Potatoes*, or *Indian Corn*, planted about the middle of May, after the sward had been twice ploughed, (once the preceding fall, if the clay is considerable,) and furrowed.

2d. Some kind of *Spring-sowed crop*, as oats, barley, peas, or flax, sowed in April, after ploughing twice, and harrowing.

3d. *Winter Rye* or *Wheat*, sowed the first or middle of September; or *Spring Wheat*, or *Rye*, sowed in April, after twice ploughing and harrowing.

4th. On the last mentioned sowing, *clover* and *timothy*—immediately after sowing if spring grain; on a late March snow, or on a damp rainy day near the last of March or in April, if winter grain. This crop is generally mowed or pastured until four, five, or six years after the seed is sown; then it is broken up and planted as before. (H. Sarles, J. A. Fort, S. Germond, W. M'Chesney, Elder Turner, C. A. Colden, W. C. Elmore, H. Du Bois, J. Carpenter, A. Worthington.)

All the mountainous parts of the county are excellent for oats, barley, flax, potatoes, turnips, beets, and carrots. And every part of the county is very productive of either grass or clover. Therefore it is an excellent county for dairies; though but few farmers at present keep large dairies. The clayey farms are very near half a month later in the spring than the sandy or loamy farms. The loamy soils can never be ploughed too deep, nor mellowed too much; but sandy and clay soils should merely be turned over, in a flat furrow, and not afterwards ploughed so deep as to break the turf. For the clay, if mellowed too much, will become mortar in wet weather, and bake in dry. And the sand will become too loose to support vegetation. (A. Worthington, W. Van Duzen, S. Gregory, L. Finch.)

Soils which contain much clay should be ploughed in the fall, and lie in furrows through the winter, for all summer crops. (J. Wadsworth, H. Hickock.)

Stones cannot be picked off too close from sandy or loamy soils; but a considerable quantity of small stones are very useful in clay-loam, for preventing its becoming too compact. (John Stephens, Ziba Hewitt.)

The soil of the Knickerbacker estate, in Schaghticoke, may be considered as the standard of excellence. It con-

tains an average of fifteen per cent. of animal and vegetable matter, and a large proportion of carbonate of lime. *Vide Analysis.*

The rotation method which has always been adopted by this family, (they have occupied it one hundred and twenty years, and five generations have been born upon it,) has been in the following simple order. Certain fields have been alternately devoted to wheat and peas. Those fields are sowed to peas in April. Immediately after the peas are harvested, it is ploughed three times, and sowed, from the 10th to the 20th of September, to wheat. After the wheat harvest it is pastured until winter; but no grass or clover seed is ever sown upon it, as these grow up spontaneously in great abundance. Sometimes oats and flax are substituted for peas. Thus a crop is harvested on each wheat field every year,—one year wheat, the other, peas, oats, or flax. Though no manure is ever applied to this land, it has yielded from twenty-five to thirty bushels of wheat per acre every other year, for ages past.

Certain other fields are devoted to Indian corn, potatoes, &c. In the culture of these there has been nearly the same uniformity. 1st. Corn and potatoes. 2d. Spring-sown grain. 3d. Wheat. Thus corn returns every fourth year.

The whole of Schaghticoke flats, consisting of almost two thousand acres, is very similar in quality, and cultivated in a similar manner. It is wholly river alluvion, in which the Hosick and the Tomhanick unite their waters.

With regard to the general application of manures, it is the opinion of every farmer with whom I conversed, that yard manure, and ashes, are most useful on land which contains a considerable proportion of clay; and that plaster has but little effect on clay soil. But that muck manure\* and

\* This is a name which our farmers give to that decomposed vegetable matter intermixed with earth which settles down into slough holes, swamps, &c.

plaster (gypsum) are the most profitable and economical manures for gravelly, loamy, and sandy land. The muck manure ought to be carted on the field in the dry part of summer, and remain in small heaps during winter, as much exposed to frost as possible. And it will not produce so much effect the first year, as it will in any of the ten ensuing years. (C. Porter, J. Brockway.) Plaster is most profitable if applied in the hottest part of the summer, particularly when sown on a clover field. (W. Canfield, J. Brockway.)

Loose sandy or gravelly soil is not benefitted by yard manure after about three years; whereas clay or clay-loam will retain it eight or ten years. Any kind of clay or even hardpan strewed upon sandy or gravelly soil, will give it consistency and prepare it for retaining manure. (Wm. Fitch, C. I. Schermerhorn, J. Hitchcock.)

Plaster produces the best effect the first year; but if a bushel or two per acre be sown on old sward ground in the heat of summer, it prepares the land for bearing a rich crop of winter wheat, or of any summer crop the next season. (W. Fitch.)

Well rotted manures should be placed under shelter a year or two for kitchen gardens. The trouble and expense of this process will be richly paid. (Dr. Hammond.)

The mountain meadows of Grafton, Berlin, Sandlake, &c. are frequently overrun with what farmers call mountain polypod, (*Dicksonia pilosiuscula*.) after they have been mowed six or eight years. Such meadows should be ploughed in June, and sowed to buckwheat, a bushel per acre, the first week in July. About ten quarts of clover and timothy seed should be sowed at the same time, and a bushel of plaster. The same process is very useful in clearing land from moss, lichens, and Canada thistles. (Dr. Hammond, A. Worthington.)



## AGRICULTURAL CALENDAR.

## SPRING WHEAT.

This crop is so frequently choaked with grass and weeds, that it ought to be sowed on land which had been hoed the preceding year. Of course it should follow potatoes or corn. The land should be twice ploughed, as early as the frost will permit a plough to enter the soil. And if the land be clay-loam or clay, it should be ploughed once the preceding fall. It should be sowed, a bushel and a half per acre, the last week in March or first week in April. (M. Youngmans, H. Platt, A. Worthington, J. Turner.)

The cultivation of spring wheat ought not to be encouraged, as it tends to increase the wheat insect, or Hessian fly, in the country. (W. Canfield, J. Phillips.) But if the wheat be soaked twelve hours in strong brine, insects will not injure the crop. (H. Knickerbacker.)

## SPRING RYE.

The same method of culture before mentioned for spring wheat, is applied to spring rye. But I was not informed of any objection to rye on account of insects. It should be sowed quite as early as spring wheat; or if either be sowed first, it should be the rye.

## OATS.

The next crop to be sown after spring wheat and rye, should be oats. The land should be twice well ploughed and harrowed, and the seed should be sowed about the middle of April. It grows best on hills or even mountains, where the soil is loam underlayed by hardpan. It seems to be, in truth, the very grain designed to furnish bread for the inhabitants of mountainous districts. (S. M'Chesney, H. Sarles, J. Stephens, Z. Hewitt, Youngmans.)

## FLAX.

Flax seed should be sowed about the 20th of April. It

grows best on land that is considerably elevated—even the hardpan mountains, thinly covered with the yellow loam, yield excellent crops of flax. (Z. Hewitt, H. Sarles, S. M'Chesney, Dr. Hammond.) Twenty-eight quarts of seed per acre is better than more. (J. Carpenter, S. Baker.)

It seems to be admitted by every farmer in the county, that ashes is the best manure for flax. The seed should be soaked about half an hour in weak lye; or rather in strong lye diluted with six times as much water. If it is taken wet from the lye and rolled in plaster, it is better. Let it be sowed on land well ploughed twice and harrowed, which had been planted with potatoes or corn (potatoes preferable) the preceding year. Just as the flax is coming up, sow on it two or three bushels of strong ashes per acre. (W. Canfield, E. Cady, W. Fitch, E. Boyce, J. Potts, J. Turner, A. Worthington, N. B. Harris.)

J. Turner raised on the mountainous tract at the northeast corner of Nassau, by a process similar to the above in all material respects 382 lbs. of flax from 35 quarts of seed.

Flax is better if pulled a little before the seed is ripe. The seed will ripen in the swath, if it is plump and full-grown before the flax is pulled. (J. Turner.)

#### BARLEY.

It should be sowed the last week in April, on land prepared as for oats. It grows best on hills and mountains, like oats. The yellow loam underlayed with hardpan on the mountains of Sandlake, Grafton, Berlin, &c. produces great crops wherever barley is sowed. But it is not cultivated there as much as it ought to be. (H. Sarles, Z. Hewitt.)

Soaking seed half an hour in weak lye, is said by several farmers to be useful. All agree that it ought not to be harvested until the straw is entirely dry.

#### PEAS.

Most farmers in the county sow peas the last week in

April or first week in May—about two bushels and a peck per acre. (M. Younghans, W. Van Dusen.) But Col. A. Worthington sows his crop the 10th of June. All complain of bugs in peas; and it has become such an evil that many farmers have entirely discontinued this crop on that account. Col. W. says he has sowed his peas on the 10th of June six years in succession, and that a bug has never been seen in his peas. Whereas his neighbours who have not adopted this practice, have scarcely a pea without a bug in it. He supposes the season for depositing the egg for the pea bug is passed before his peas are in flower.

Peas the best of all crops to precede wheat. (C. R. Colden.) Peas ground with corn, make the best of feed for fattening hogs. (S. Germond, J. Knickerbacker.)

#### POTATOES.

Potatoes should be planted the first ten days in May, or a little before planting Indian corn. But it is better to postpone the planting of potatoes than of corn. Therefore in the hurry of spring work, farmers often leave their potatoes to be planted the last week in May. To plant them earlier will never injure the crop in any season; and if the season happens to be very dry about harvest time, the crop will be much better if planted the first of May. (J. Bratt, H. Moffit, C. D. Colden, J. Knickerbacker, B. Mather, M. Younghans, J. Carpenter, J. Masters.)

Potatoes always a sure crop in the yellow loam of the mountainous parts of the county. (H. Sarles, S. M'Chesney, Z. Hewitt.) Elder Turner, of Nassau, whose farm is one of the most mountainous in the county, plants potatoes the fore part of May on sward land, and rarely has less than four or five hundred bushels from an acre. On all soils potatoes should be planted on sward land about the first of May, if convenient. (A. Bush.)

Seed potatoes should never be cut—one large whole pota-

toe is sufficient for a hill. The outside skin of a potatoe, called the cuticle, is the most durable part, and retains the moisture for the use of the young plant, until it is all exhausted. If potatoes are cut, the nutritive juice is absorbed in a great measure by the earth. The evil of cutting seed potatoes is more manifest on a dry soil than if moist. It is a mistaken opinion that a whole potatoe is not so good on account of bringing the plants too near together; for the roots, which yield all we seek for, spread in all directions, and fill the hill. (Elder Turner.)

Potatoes, if planted in sandy or loamy soil, will yield one third more if a table spoonful of plaster be thrown upon the naked potatoes in each hill, after they are dropped, and before they are covered. (W. Fitch, H. Platt, W. Canfield, N. B. Harris.)

Yard manure is very useful, if laid over the potatoes in each hill, after an inch of soil has been laid upon them; and then the hill covered as deep as usual. But if the manure is laid directly upon the naked seed, or under it, a drought will injure the crop. (A. Mather.)

The most convenient method for raising potatoes is to plant them about the margins of cornfields. Then a horse may turn upon them when ploughing among the corn, without injury. (W. C. Elmore, A. Worthington.)

Potatoes should be hoed when first up, just to clear out the weeds, without making any hill. After they grow up about six or seven inches, they should be hilled up for the last time. If weeds spring up among them, they should be pulled out, not hoed out. For if hoed again, many new potatoes will set, which will never grow large enough for use, but will check the growth of those early set. (Elder Turner, M. Warren, G. R. Davis, U. Gregory.)

#### INDIAN CORN.

A large majority of the farmers of Rensselaer county, pre-

fer the middle of May for the planting season; and prefer twice ploughing and furrowing. But if the land is very dry and warm, the corn should be planted the first week in May, to prevent suffering by drought. (J. Knickerbacker.)

Corn is generally best on all soils, if planted on sward land, which had been sowed to plaster, a bushel per acre, in the hottest part of the preceding summer. But it is generally the best economy to let one crop of wheat precede it, if the land will bear wheat. When corn is raised on clay loam, it ought always to follow sward; and should be once ploughed the preceding fall. (Elder Turner, S. Howard, J. Masters.) Ashes, or lime, ought always to be applied to the top of corn-hills immediately after planting, if it follows sward, to prevent grub larva from destroying it. (J. Masters, I. Phillips.)

Clay soil, (not clay loam.) and sandy land should have the turf turned over very flat, and be lightly harrowed lengthwise of the furrows; and then be furrowed by the mere scratch of a light plough. (H. Dubois, J. Phillips, C. I. Schermerhorn.)

Most farmers in the county wet the seed corn, and roll it in plaster; and when the corn is hoed once, they apply a table spoonful of plaster to each hill, unless the soil contains a large proportion of clay. In that case ashes is used as a substitute.

Every farmer prefers stirring the soil about the hills of corn, at least three times during the season. But they differ considerably as to the times and methods. If the soil is sandy, or a fine loam, it may be harrowed once and ploughed twice, as a substitute for hoeing. But one should go through the field each time with a hoe, and set up all those hills which may have been disturbed by the team or plough. (W. Canfield, I. Phillips, J. Potts, E. Boyce, B. Mather.) This method is not considered as preferable in any case, excepting where a farmer has land enough, and labour is high. These regular hoeings and ploughings must, under all other circumstances, be preferable.

Some farmers top the stalks, and save the tops for fodder, leaving the part below the ears to rot in the field. The best method of harvesting corn is, to cut up the whole hill, near the root, with a sickle, about the 10th of September, and dry it in small stacks of five bundles each. Then cart it into the barn, husk off the ears, and put up the stalks for fodder. This yields a great quantity of the best of fodder for winter milch cows. (B. Mather, S. Gregory.)

Seed corn should be selected from the first that is ripe, and saved by stripping down the husks over the stems, braiding the ears together, in bunches of two or three dozen each, and hanging them up in a garret or other dry place. Corn is so apt to suffer from moisture, that no other known method seems to be sufficiently guarded. (J. Potts, E. Boyce, J. A. Fort, H. Moffit.)

#### BUCKWHEAT.

Few persons in the county cultivate buckwheat. They consider it rather as the proper grain to be cultivated by the indolent and slovenly. All agree, however, that it is useful in driving out the oxeyed daisy, (*crysanthemum leucanthemum*;) butter-cup crowfoot, (*ranunculus acris*;) Canada thistle, (*cnicus arvensis*;) and other noxious weeds, as well as the quack-grass, or couch-grass, (*triticum repens*.) It is sowed some time in July, and will grow very well on the most barren land in the county, if well plastered. But all farmers agree that it impoverishes land.

#### TURNIPS.

There is no difficulty in raising turnips on new land; but it is very desirable to know the best method of raising them, at least a small patch every year, on old farms. Mr. Henry Du Bois, of this county, and Maj. E. Cady, of Columbia county, say, that they have succeeded in obtaining good crops several years in succession, by the following process. Turn over a turf of old sward the first week in June. Yard

cattle at night on this, in the proportion of six head at least to a quarter of an acre, until the 20th of July. Then harrow lengthwise of the furrows, so as not to disturb or overturn them, and sow in the proportion of about half a pound of seed per acre.

If it is not convenient to yard cattle upon it sufficiently, about two inches of well rotted manure harrowed in as above will do for a substitute. Mr. C. R. Colden applies the manure by strewing it in shallow furrows two feet apart, then buries the manure by two side-furrows, and harrows the ground level lengthwise of the furrows. He sows the seed in drills over the manured furrows. This method requires less manure, and he has the advantage of hoeing the turnips in drills.

#### WINTER RYE.

Rye should be sowed the last week in August, or the first week in September, at the rate of about thirty-six quarts per acre, some say forty-eight quarts. (M. Youngbans, S. Gregory, U. Gregory.) But if it is not sowed at that time, it ought to be delayed until late in November, so that it may not come up until spring. (H. S. Vandercook, U. Gregory, M. Warren.) A. Worthington had a good crop, which he sowed in a January snow storm.

Rye raised on upland makes much better flour than that which is raised on low or damp land. (J. Masters, M. Warren, A. Worthington.) And any rye will be much better, for harvesting while the joints of the straw are green. (J. Knickerbacker, J. A. Fort, J. Carpenter, A. Worthington, W. Canfield, S. Gregory.) But H. Platt says, he has made the trial to his entire satisfaction, and believes it will not make so much, nor so good flour, as it will if cut when fully ripe and the straw perfectly dry.

#### WINTER WHEAT.—CLOVER AND GRASS.

#### KITCHEN GARDENING.—CONDIMENTS.—FRUIT TREES.—

#### FOREST TREES AND SHRUBS.—LIVE STOCK.

[The particulars under the above several heads, omitted for want of room.]

NOTICE RESPECTING SEVERAL VEGETABLES, USED AS ESCULENTS, (OR FOOD,) IN NORTH AMERICA. IN A LETTER TO RICHARD ANTHONY SALISBURY, ESQ. F. R. S., &c. By M. JOSEPH CORREA DE SERRA, F. R. S., &c.—1821.

**T**HIS article, which has never appeared, so far as we know, in any American work, was published in the London Horticultural Transactions. There are various and powerful reasons, why we should do ourselves honour, and render a just tribute to the enlightened author by republishing it. Mr. Correa de Serra selected this country as an asylum during the convulsions to which his native country, Portugal, was exposed. He finally enjoyed the honour of representing Portugal at the American Court, as its Minister. His various and extensive knowledge, particularly his profound acquaintance with natural history is known to every man of reading in our country. He enjoyed the friendship and confidence of most of the distinguished characters in this country, and it would not be extravagant to say, that no foreigner ever visited our shores, who possessed a mind more enlarged, or better cultivated. He devoted much of his time to the study of the plants and natural productions of the United States, and it would not be more than just praise to say that he contributed as much as any man to the encouragement of a taste for natural history, now assuming something like its due share of importance in our country. We owe it therefore to his memory to put upon our printed records this memorial of one of the most accomplished scholars, whom we have had the happiness to welcome in our country.

Although the subject is an American one, and therefore it might be supposed familiar to us, yet our country is so vast in extent, that it is probable many of the facts will be as new to a great portion of our population as they were to the Europeans.

The paper hereinafter published was read to the London



Horticultural Society, July 17, 1821. It was addressed to one of the Trustees of that Board.

“DEAR SIR,

“It is impossible to foresee the full extent of happy consequences which may result from the labours of the Horticultural Society. It is the *first attempt*, that I know of, towards a confederation of *science* and *practice* directed to raise Horticulture *above* the state of an *Empiric* art, such as it has been heretofore. Now the encreasing capital of botanical knowledge will furnish new objects, on which to try the proceedings of cultivation, and the daily progress of vegetable physiology will no doubt direct these proceedings by clearer and safer principles, extending their application to almost every plant which nature has made fit for the food of man.

“I wish this example first given by your glorious Island [it must be known, that M. Correa de Serra was not British in his feelings, but highly republican] may be followed by all other civilized nations, and propagate the taste for such enlightened pursuits, which add to the comforts and pleasures of mankind, *unaccompanied with any counterbalancing evil*. If in future I enjoy sufficient leisure, I will try to concur, myself, in an undertaking so analogous to my way of thinking and feeling.

“For the present I venture to offer you the enumeration of a few plants, not yet cultivated in Europe, which my long residence in North America suggests to my recollection. You may present it to the Society, if you think it in any wise deserving of that honour.

“1st. The young shoots of the *Phytolacca decandra*, (see Botanical Magazine page 931) which the Americans call ‘poke’ are brought in quantities to the Philadelphia market early in the season. They are eaten as a substitute for *Asparagus* which they resemble in taste. The plant requires no cultivation and if it were treated, as you treat the *Crambe*

maritima (Sea Kale) the taste of the sprouts would scarcely be distinguished from the real Asparagus.

[This information is entirely new to us, though we live only three days ride from Philadelphia. The *Phytolacca decandra* is very common by our road sides in the interior, though rather rare near Boston. Dr. Bigelow gives to it besides the popular name of Poke, that of "Cocum." It might easily be introduced into our grounds. Medicinal properties are ascribed to its root, but this should be no objection to its culture, as the same is true of the Rhubarb, now in so general use. It is at least well to know, that our neighbours in Pennsylvania use this plant in large quantities, as an Esculent.]

"2d. The Americans, settled on the Washita river, and in the Arkansaw Territory, as well as the travellers who have visited those countries, speak in terms of commendation, of a species of Wild Cabbage, which grows wild in those countries, and which bears *red* flowers. Muhlenberg, the *famous* American botanist, in his catalogue of *American* plants, (page 61), has given to it the name of *Brassica Washitana*. I wish the Society would attempt the introduction, and *civilization* of this plant. From the effects produced by cultivation in other parts of this family, we may expect, in a short period, a number of varieties, and some of them probably very valuable.

[Shall we suffer the Europeans (as they have often done,) to precede us in the cultivation of our own native plants, and to send them back to us in an highly improved state and sometimes even as *novelties*? It does not seem to us to comport with the high stand which we are aiming to take in all the arts. Let us shew what we can make of our own native productions and not receive them improved by the culture, and skill of others.]

"3d. The *Capsella bursa pastoris*, or common Shepherd's purse (*Thlaspi bursa pastoris*, English botany 1485) is an escu-

lent plant in Philadelphia, brought to market in large quantities in the early season. The taste, when boiled, approaches that of the Cabbage, but softer and milder. This plant varies wonderfully in size and succulence of leaves according to the nature and state of the soil where it grows. Those from the gardens and highly cultivated spots near Philadelphia come to a size and succulence of leaf scarcely to be believed without seeing them. They may be easily bleached by the common methods and certainly in that state would be a valuable addition to the list of delicate culinary vegetables.

[NOTE. This plant is very abundant in all the gardens in the vicinity of Boston. If instead of extirpating it early, (for it is among the earliest plants) we should cover it partially with earth and blanch it, it might afford a valuable vegetable, coming in after the dandelion, and before the asparagus.]

“4th. The *Hydrophyllum Virginicum* is called by the Americans of the Western States, Indian Sallad, or Shawanese Sallad, because the Indians eat it as such while tender. Some of the first settlers do the same. From having tasted it once in Kentucky, I am of opinion that this plant deserves a fair trial of cultivation. (Few persons were better judges of what is palatable than the Abbé de Correa.)

“5th. The *Apios tuberosa*. (*Glycine Apios*) which grows wild in many parts of the United States, produces on its roots a number of tuberosities of a good size, and very good taste.

“The Indian and American settlers eat them greedily when they find them, but never to my knowledge have attempted to cultivate them, though in my opinion they deserve a place among our culinary vegetables. I have not the least doubt of their succeeding well in England.

[This plant under the name of ground nut was familiar to our forefathers in New-England. It is rather singular that we have not attempted the cultivation of them. I have met

but with one plant of them, and that I transplanted while it was in flower, and lost it. An ample compensation will be given to any person who shall bring to the subscriber either this autumn, or next spring, two or three dozen roots. I wish to see, if cultivation and care will not enlarge the tubers and improve them.—JOHN LOWELL, Roxbury.]

“6th and 7th. The bulbs of the Quamash (*Scilla esculenta*) which *Nuttal* makes a species of *Phalangium*. (*Nuttal's Genera of North American plants*, page 219), with the tubers of the *Psoralia esculenta* (*Pursh flora Americana Septentrionalis*, Vol. II. page 475) are the usual vegetable food of many Indian tribes, and were one of the supports of the people composing the American expedition through the continent to the Pacific Ocean under Captains Lewis and Clarke. Both these plants may probably prove valuable acquisitions; *at all events*, they are fit subjects for the inquiry of the Society. [We add, *still more proper* subjects for the inquiry of an American Agricultural Society.]

“8th. The Indians about Columbia river gather vast quantities of large tubers of an aquatic plant, which, according to the late Professor Barton of Philadelphia, who had seen dried specimens of it brought by Capt. Lewis, is a species of *Sagittaria*. These tubers are an important part of the diet of these tribes.

“You may see in Osbeck's voyage to China, that similar tubers from a species of *Sagittaria* grew in the watery places about Canton, and if I well remember are purposely cultivated, turning to profit those naturally unproductive spots.

“Would not this object be worthy of the attention of the Society? If perchance, indications of this nature, directed chiefly to increase the number of useful objects of cultivation meet the indulgence of the Society, I shall feel encouraged to continue this kind of communication.

I am, &c. &c.

JOSEPH CORREA DE SERRA.”

NOTE. Unhappily for science this great naturalist did not live to make any further communications. Would it not be practicable, and certainly it would be honourable to those who should do it to bring home some roots of the Esculent *Sagittaria* of Canton and of the *North West*? All that would be required would be a very tight box. Although an aquatic plant, all the *Sagittarias* will live and thrive without great moisture. They might be brought to this country, and our national character requires, that we should not let Europe send this native plant to us, as she has done many others.

We hope this purely American article will not be considered as misplaced in our Journal.

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REMARKS ON THE PRESENT SYSTEM OF ROAD MAKING ;  
WITH OBSERVATIONS, DEDUCED FROM PRACTICE AND EXPERIENCE. By JOHN LONDON M'ADAM, Esq.

[The incalculable advantage of good roads to the whole population of a country is not a subject of dispute. The writer who proposes the following article for publication, heard a respectable farmer, who had resided fifty years or more in the vicinity of Boston, assert a short time since, that fuel is now cheaper than it was thirty years ago, and the reason he gave why it should be so was that the roads were so much better, that it had become more of an object to a wider district of country to bring wood to the capital. This greater facility of intercourse, considered in all its bearings on the business of the country—as a cause of greater improvement of the soil, and of increased production—would lead to an estimate of benefit which, though perfectly fair and just, would transcend probably any apparently reasonable conjecture. With all the enterprise, care and cost employed in adding to the number and improving the condition of our roads we are now suffering in common with Great Britain from having been ignorant of “*the science of road making*.” Mr. M'Adam's system is considered in England as the true theory, established to the satisfaction of the public by its application under various circumstances upon several hundred miles of road in different parts of the Kingdom. Some apology might at first seem to be due for the length of this extract. But if any part of it had been omitted the reader would have had to regret the loss of something necessary to a full understanding of M'Adam's plan. The enterprising government of the City of Boston is now engaged in preparing stone for a fair experiment upon some one or more of the streets.]

“By the improvement of our roads, every branch of our ag-

ricultural, commercial, and manufacturing industry would be materially benefited. Every article brought to market would be diminished in price; the number of horses would be so much reduced, that by these, and other retrenchments, the expense of FIVE MILLIONS would be annually saved to the public. The expense of repairing roads, and the wear and tear of carriages and horses, would be essentially diminished; and thousands of acres, the produce of which is now wasted in feeding unnecessary horses, would be devoted to the production of food for man. In short, the public and private advantages, which would result from effecting that great object, the improvement of our highways and turnpike roads, are incalculable; though from their being spread over a wide surface, and available in various ways, such advantages will not be so apparent as those derived from other sources of improvement, of a more restricted and less general nature."

"The observations I have made in a period of twenty-six years on the roads of the kingdom, in which time I have travelled over the greater number in England and Scotland, and the opportunities I have had of making comparisons on the different materials and the modes of their application, have led me to form the following conclusions.

"1st. That the present bad condition of the roads of the kingdom is owing to the injudicious application of the materials with which they are repaired, and to the defective form of the roads.

"2d. That the introduction of a better system of making the *surface* of roads, and the application of scientific principles, which has hitherto never been thought of, would remedy the evil.

"In illustration of these positions, I beg to observe, that the object to be attained in a good road, as far as regards the surface, is to have it smooth, solid, and so flat as that a carriage may stand upright; these objects are not attained by

the present system, because no scientific principles are applied; but it is presumed they are perfectly attainable in all parts of the country.

“Stone is to be procured in some form in almost every part of the kingdom, and a road made of small broken stone to the depth of ten inches, will be smooth, solid and durable.

“The materials of which the present roads are composed, are not worn out; but are displaced by the action of the wheels of carriages upon stones of too large a size: the wheel does not *pass over* the materials of which the road is formed, but is constantly, almost at every step, encountering an obstacle which must either give way and be removed, or the carriage must be lifted by the force of the cattle so as to surmount it; in either case the road is injured, and the carriage impeded, and the injury and impediment will be great in the exact proportion to the number and size of the obstacles.

“The size of stones for a road has been described in contracts in several different ways, sometimes as the size of a hen’s egg, sometimes at half a pound weight. These descriptions are very vague, the first being an indefinite size, and the latter depending on the density of the stone used, and *neither* being attended to in the execution. The size of stone used on a road must be in due proportion to the space occupied by a wheel of ordinary dimensions on a smooth level surface, this point of contact will be found to be, longitudinally about an inch, and every piece of stone put into a road, which exceeds an inch in any of its dimensions, is mischievous.

“The roads in Scotland are worse than those in England, although materials are more abundant, of better quality, and labour at *least* as cheap, and the toll duties are nearly double; this is because road making, that is the surface, is even worse understood in Scotland than in England.”

A road ought to be considered as an artificial flooring forming a strong, smooth, solid surface, at once capable of

carrying great weight, and over which carriages may pass without meeting any impediment.\*

*To the Right Honourable the President, and the Board of Agriculture.*

Having communicated to your Honourable Board, some observations on making and repairing roads, in February, 1819, I beg leave to add the following, which have arisen from increased experience on the subject, and also from a

\* Other cases of several kinds have occurred where a different method must be adopted, but which it is impossible to specify, and must be met by the practical skill of the Officer whose duty it may be to superintend the repair of a road, and who must constantly recur to general principles. These principles are uniform, however much circumstances may differ, and they must form the guide by which his judgment must be always directed.

When additional stone is wanted on a road that has consolidated by use, the old hardened surface of the road is to be loosened with a pick, in order to make the fresh materials unite with the old.

Carriages, whatever be the construction of their wheels, will make ruts in a new made road until it consolidates, however well the materials may be prepared, or however judiciously applied; therefore a careful person must attend for some time after the road is opened for use, to rake in the track made by wheels.

The only proper method of breaking stones, both for effect and economy, is by persons *sitting*; the stones are to be placed in small heaps, and women, boys, or old men past hard labour, must sit down with small hammers and break them, so as none shall exceed six ounces in weight.

*The Tools to be used are,—*

Strong picks, but short from the handle to the point, for lifting the road.

Small hammers of about one pound weight in the head, the face the size of a new shilling, well steeled, with a short handle.

Rakes with wooden heads, ten inches in length, and iron teeth about two and an half inches in length, very strong for raking out the large stones when the road is broken up, and for keeping the road smooth after being relaid, and while it is consolidating.

Very light broad mouthed shovels, to spread the broken stone and to form the road.

Every road is to be made of broken stone without mixture of earth, clay, chalk, or any other matter that will imbibe water, and be affected with frost; nothing is to be laid on the clean stone on pretence of *binding*; broken stone will combine by its own angles into a smooth solid surface that cannot be effected by vicissitudes of weather, or displaced by the action of wheels, which will pass over it without a jolt, and consequently without injury.



desire of calling your attention to the effects of the late severe winter on the roads of the country, and the confirmation afforded to the opinions I have endeavoured to introduce on the construction of roads.

During the late winter, and particularly in the month of January, 1820, when the frost was succeeded by a sudden thaw, accompanied by the melting of snow, the roads of the kingdom broke up in a very alarming manner, and to an extent that created great loss and inconvenience by the interruption of communication, and the delay of the mails, and also occasioned a very heavy extra expenditure by the Post-office.

The obvious cause of this defect of the roads, was the admission of water from the loose and unskilful method of their construction. Previous to the severe frost, the roads were filled with water, which had penetrated through the ill-prepared and unskilfully laid materials: this caused an immediate expansion of the whole mass during the frost, and upon a sudden thaw, the roads became quite loose, and the wheels of carriages penetrated to the original soil, which was also saturated with water, from the open state of the road. By this means, many roads became altogether impassable, while the whole were rendered deep, and inconvenient to be travelled upon.

Of all the roads which have been thoroughly re-made, according to the directions which I had the honour to submit to your honourable Board last spring, not one has given way, nor has any delay taken place through the severity of the late season.

As every winter has, in some degree, presented such inconveniences, and as it has been observed that very severe winters occur in England every six or seven years, it is of great consequence to consider of the means of constructing the roads of the kingdom in such a manner as shall prevent their being in future effected by any change of weather or season.

The roads can never be rendered thus perfectly secure, until the following principles be fully understood, admitted, and acted upon: namely, that it is the native soil which really supports the weight of traffic: that while it is preserved in a dry state, it will carry any weight without sinking, and that it does in fact carry the road and the carriages also; that this native soil must previously be made quite dry, and a covering impenetrable to rain, must then be placed over it, to preserve it in that dry state; that the thickness of a road should only be regulated by the quantity of material necessary to form such impervious covering, and never by any reference to its *own* power of carrying weight.

The erroneous opinion so long acted upon, and so tenaciously adhered to, that by placing a large quantity of stone under the roads, a remedy will be found for the sinking into wet clay, or other soft soils, or in other words, that a road may be made sufficiently strong, *artificially*, to carry heavy carriages, though the sub-soil be in a wet state, and by such means to avert the inconveniences of the natural soil receiving water from rain, or other causes, has produced most of the defects of the roads of Great Britain.

At one time I had formed the opinion that this practice was only a useless expense, but experience has convinced me that it is likewise positively injurious.

It is well known to every skilful and observant road-maker, that if strata of stone of various sizes be placed as a road, the largest stones will constantly work up by the shaking and pressure of the traffic, and that the only mode of keeping the stones of a road from motion, is to use materials of a uniform size from the bottom. In roads made upon large stones as a foundation, the perpetual motion, or change of the position of the materials, keeps open many apertures through which the water passes.

It has also been found, that roads placed upon a hard bottom, wear away more quickly than those which are placed

upon a soft soil. This has been apparent upon roads where motives of economy, or other causes, have prevented the road being lifted to the bottom at once ; the wear has always been found to diminish, as soon as it was possible to remove the hard foundation. It is a known fact, that a road lasts much longer over a morass than when made over rock. The evidence produced before the Committee of the House of Commons, shewed the comparison on the road between Bristol and Bridgwater, to be as five to seven in favour of the wearing on the morass, where the road is laid on the naked surface of the soil, against a part of the same road made over rocky ground.

The practice common in England, and universal in Scotland, on the formation of a new road, is, to dig a trench below the surface of the ground adjoining, and in this trench to deposit a quantity of large stones ; after this, a second quantity of stone, broken smaller, generally to about seven or eight pounds weight ; these previous beds of stone are called the bottoming of the road, and are of various thickness, according to the caprice of the maker, and generally in proportion to the sum of money placed at his disposal. On some new roads, made in Scotland, in the summer of 1819, the thickness exceeded three feet.

That which is properly called the road, is then placed on the bottoming, by putting large quantities of broken stone or gravel, generally a foot or eighteen inches thick, at once upon it.

Were the materials of which the road itself is composed, properly selected, prepared, and laid, some of the inconveniences of this system might be avoided ; but in the careless way in which this service is generally performed, the road is as open as a sieve to receive water ; which penetrates through the whole mass, is received and retained in the trench whence the road is liable to give way in all changes of weather.

A road formed on such principles has never effectually answered the purpose which the road-maker should constantly have in view ; namely, to make a secure, level flooring, over which carriages may pass with safety, and equal expedition, at all seasons of the year.

If it be admitted, as I believe it is now very generally, that in this kingdom an artificial road is only required to obviate the inconvenience of a very unsettled climate ; and that water with alternate frost and thaw, are the evils to be guarded against, it must be obvious that nothing can be more erroneous than providing a reservoir for water under the road and giving facility to the water to pass through the road into this trench, where it is acted upon by frost to the destruction of the road.

As no artificial road can ever be made so good, and so useful as the natural soil in a *dry state*, it is only necessary to procure, and preserve this dry state of so much ground as is intended to be occupied by a road.

The first operation in making a road should be the reverse of digging a trench. The road should not be sunk below, but rather raised above, the ordinary level of the adjacent ground, care should at any rate be taken, that there be a sufficient fall to take off the water, so that it should always be some inches below the level of the ground upon which the road is intended to be placed : this must be done, either by making drains to lower ground, or if that be not practicable, from the nature of the country, then the soil upon which the road is proposed to be laid, must be raised by addition, so as to be some inches above the level of the water.

Having secured the soil from *under* water, the road-maker is next to secure it from rain water, by a solid road, made of clean, dry stone, or flint, so selected, prepared, and laid, as to be perfectly impervious to water : and this cannot be effected, unless the greatest care be taken, that no earth, clay, chalk, or other matter, that will hold or conduct water,

be mixed with the broken stone ; which must be so prepared and laid, as to unite by its own angles into a firm, compact, impenetrable body.

The thickness of such road is immaterial, as to its strength for carrying weight ; this object is already obtained by providing a dry surface, over which the road is to be placed as a covering, or roof, to preserve it in that state : experience having shewn, that if water passes through a road, and fill the native soil, the road, whatever may be its thickness, loses its support, and goes to pieces.

In consequence of an alteration in the line of the turnpike road, near Rownham Ferry, in the parish of Ashton, near Bristol, it has been necessary to remove the old road. This road was lifted and relaid very skilfully in 1816 ; since which time it has been in contemplation to change the line, and consequently, it has been suffered to wear very thin. At present it is not above three inches thick in most places, and in none more than four : yet on removing the road it was found, that no water had penetrated, nor had the frost affected it during all the late winter ; and the natural earth beneath the road was found perfectly dry.

Several new roads have been constructed on this principle within the last three years. Part of the great north road from London by Hoddesdon in Hertfordshire—two pieces of road on Durdham Down, and at Rownham Ferry, near Bristol—with several private roads, in the eastern part of Sussex.

None of those roads exceed six inches in thickness, and although that on the great north road is subjected to a very heavy traffic, (being only fifteen miles distant from London) it has not given way, nor was it effected by the late severe winter ; when the roads between that and London became impassible, by breaking up to the bottom, and the mails and other coaches were obliged to reach London by circuitous routes. It is worthy of observation, that these bad roads cost more money per mile for their annual repair, than the original making of this useful new road.

Improvement of roads, upon the principle I have endeavoured to explain, has been rapidly extended during the last four years. It has been carried into effect, on various roads, and with every variety of material, in seventeen different counties. These roads being so constructed as to exclude water, consequently none of them broke up during the late severe winter; there was no interruption to travelling, nor any additional expense by the Post-office in conveying the mails over them, to the extent of upwards of one thousand miles of road.

Many new roads, and to a considerable extent, are projected for the ensuing season. Some of them are to be assisted by grants or loans from government, and it will be a great saving of property, and enable government to extend their assistance more effectually, if these roads be made in the most approved and economical manner.

The measure of substituting pavements, for convenient and useful roads, is a kind of desperate remedy to which ignorance has had recourse. The badness, or scarcity of materials, cannot be considered a reasonable excuse; because the same quantity of stone required for paving, is fully sufficient to make an excellent road any where: and it must be evident, that road materials of the best quality may be procured at less cost than paving stone.

The advantages of good roads, when compared with pavements, are universally acknowledged; the extension of pavement is therefore to be deprecated as an actual evil, besides the greatness of the expense. Pavements are particularly inconvenient and dangerous on steep ascents, such as the ascent to bridges, &c. A very striking example of this may be observed on the London end of Black-friars Bridge where heavy loads are drawn up with great difficulty, and where more horses fall and receive injury, than in any other place in the kingdom. The pavement in such places should be lifted, and converted into a good road; which may be done

with the same stone, at an expense not exceeding ten-pence per square yard. This road would be more lasting than the pavement, and, when out of order, may be repaired at less than one tenth of the expense which relaying the pavement would require.

This measure has been adopted with great success, and considerable saving of expense, in the suburbs of Bristol, where the pavements were taken up, and converted into good roads, about three years ago.

The advantages of the system recommended is so obvious to common observation in the repair of old roads, and has been practised to an extent so considerable, during the last four years, that the minds of most people have become reconciled to it; and objections, founded on old prejudice and suspicion, have given way to experience, but the application of the same principles to the construction of new roads, has necessarily been much more limited. It will, therefore, require more liberality and confidence on the part of country gentlemen, and also more patient investigation of the principles on which the system is founded, before they will allow of its adoption on new lines of road. It is to be hoped, however, that the importance of the subject will recommend it to general consideration.

Mr. John Loudon M'Adam having for many years directed his attention, as a magistrate and a commissioner to the improvement of roads, was induced to accept the situation of general surveyor of an extensive trust round the city of Bristol.

The admirable state of repair into which the roads under his direction were brought, attracted very general attention; and induced the commissioners of various districts to apply for his assistance or advice.

The general testimony borne to his complete success wherever he has been employed, and the proof that his im-

provements have been attended with an actual reduction of expense, while they have afforded the most useful employment to the poor, induce your Committee to attach a high degree of importance to that which he has already accomplished. The imitation of his plans is rendered easy by their simplicity, and by the candour with which he has explained them, though ability in the surveyor to judge of their application must be understood as an essential requisite.

Your Committee have dwelt on this improved system of making roads, as a preliminary consideration to any alteration of the laws, being persuaded that it is of essential importance to adapt the law to new circumstances; that the first step requisite is to take effectual measures for ensuring the *formation* of good roads; and that their preservation afterwards, if proper principles for their repair be once adopted, will require fewer legislative regulations than former inquiries have deemed necessary.

[Reference is made to the following minutes of evidence taken by a Committee of the House Commons.]

*John Loudon M'Adam*, Esq. called in; and Examined.

I believe Mr. M'Adam, you reside in Bristol?—Yes, I do.

And have under your care a considerable district of the turnpike roads in that neighbourhood?—Yes, about one hundred and eighty miles of road in that neighbourhood.

How long has your attention been particularly directed to the state of the public roads of the kingdom generally, and the means of their improvement?—About twenty-five years.

Are you a professional civil engineer?—No.

Be pleased to state to the Committee the general state of the turnpike roads at the time you first directed your attention to them, about twenty years ago?—I think the state of the roads twenty years ago, was worse generally than at present, and in particular places much worse. If the Committee would indulge me, I would mention what first led me to these considerations. On my first arriving from America in the year 1783, at the



time the roads were making in Scotland (where, at that time the Turnpike Acts being in operation about twenty years) very many of their roads were unmade. I was then appointed a commissioner of the roads, and had occasion in that capacity to see a great deal of road-work.

Where?—In Scotland. This first led me to inquire into the general method of road-making, and the expense of it. Since that period, I have been mostly in Bristol, where I was also appointed a commissioner of the roads; the very defective state of which could not fail to attract my attention. I was induced to offer myself to the commissioners, to take charge of the roads as a surveyor, because I found it impossible for any individual commissioner to get the roads put into a situation of being mended with any prospect of success; and no individual could incur the expense of making experiments on a great scale. The roads of Bristol were accordingly put under my direction in the month of January 1816.

That was when you were appointed surveyor?—Yes, I have travelled at various times, during the last twenty years, to ascertain which are the best roads, and which the best means of road-making over the whole kingdom, from Inverness in Scotland to the Land's End in Cornwall. I have obtained all the information that an unauthorised person could expect to receive. In the course of travelling through the country, I have generally found the roads in a very defective state, certainly much worse in particular parts of the country than in others; and in particular counties I have found some parts of the roads much worse than in other parts of the same county. The defects of the roads appear to me to proceed from various causes, but principally from the large use of a mixture of clay and chalk and other matters, that imbibe water, and are affected by frost. Such roads become loose in wet weather, so as to allow the wheels of carriages to displace the materials, and thereby occasion the roads to be rough and rutty. More pains, and much more expense, have been bestowed on the roads of late years, but without, in my opinion, producing any adequate effect, from want of skill in the executive department.

Does the superiority of roads, in certain places that you have mentioned, arise from their better materials in those neighbourhoods?—No: the same material is found in many parts of the kingdom with much worse roads.

Then, in general, you impute the badness of the roads solely to the applying of the materials?—Yes.

And also to the formation of the roads?—That I consider as part of the application of the materials.

Has there prevailed of late years a general spirit of improvement, in different parts of the country, with regard to the roads?—I think there has, and particularly in the west country.

From the experience you have had in the improvements that have taken place, have you found that these have been attended generally with an increase or diminution of expense?—In general the expense must be diminished by the improvements.

Have you found that a similar diminution of expense has taken place where the materials have been bad as where they have been good?—Yes, I have.

Do you find your mode of management equally applicable where the materials are bad as where they are good, and that the same proportionable benefit arises?—I am afraid gentlemen suppose that I have some particular mode of management, which is certainly not the case, nor can by any means be the case; and in every road I have been obliged to alter the mode of management, according to the situation of the roads, and sometimes according to the finances.

In the formation of roads under your management, to what shape do you give the preference: I allude to the convex shape or the flat?—I consider a road should be as flat as possible with regard to allowing the water to run off at all, because a carriage ought to stand upright in travelling as much as possible. I have generally made roads three inches higher in the centre than I have at the sides, when they are 18 feet wide; if the road be smooth and well made, the water will run off very easily in such a slope.

Do you consider a road so made will not be likely to wear hollow in the middle, so as to allow the water to stand, after it

has been used for some time?—No; when a road is made flat, people will not follow the middle of it as they do when it is made extremely convex. Gentlemen will have observed that in roads very convex, travellers generally follow the track in the middle, which is the only place where a carriage can run upright, by which means three furrows are made by the horses and the wheels, and the water continually stands there: and I think that more water actually stands upon a very convex road than on one which is reasonably flat.

In what way do you make the watercourses at the sides of the road; I ask that question, having observed the farmers, in exercising their power of cleaning out their ditches, dig them to such a depth as to render them dangerous to be passed at night?—I always wished the ditch to be so dug as that the materials of the road should be three or four inches above the level of the water in the ditch, and to that point we endeavour to bring the farmers, but they are very unwilling to clean the ditches at any time when called upon, and when they do it, if they find vegetable mould in any quantity at the bottom of the ditch, they will prosecute their inquiry much deeper than is useful, or proper for safety.

What depth of solid materials would you think it right to put upon a road, in order to repair it properly?—I should think that ten inches of well consolidated materials is equal to carry anything.

This is, provided the substratum is sound?—No; I should not care whether the substratum was soft or hard; I should rather prefer a soft one to a hard one.

You don't mean that you would prefer a bog?—If it was not such a bog as would not allow a man to walk over, I should prefer it.

What advantage is derived from the substrata not being perfectly solid?—I think, when a road is placed upon a hard substance, such as a rock, the road wears much sooner than when placed on a soft substance.

But must not the draught of a carriage be much greater on a road which has a very soft foundation, than over one which is of

a rocky foundation?—I think the difference would be very little indeed, because the yield of a good road on a soft foundation, is not perceptible.

To use the expression to which you have alluded, as being used by the coachmen, would a carriage run so true upon a road, the foundation of which was soft, as upon one of which the foundation was hard?—If the road be very good, and very well made, it will be so solid, and so hard, as to make no difference. And I will give the Committee a strong instance of that, in the knowledge of many gentlemen here. The road in Somersetshire, between Bridgewater and Cross, is mostly over a morass, which is so extremely soft, that when you ride in a carriage along the road, you see the water tremble in the ditches on each side; and after there has been a slight frost, the vibration of the water from the carriage on the road, will be so great as to break the young ice. That road is partly in the Bristol district. I think there is about seven miles of it, and at the end of those seven miles, we come directly to the limestone rock. I think we have about five or six miles of this rocky road immediately succeeding the morass; and being curious to know what the wear was, I had a very exact account kept, not very lately, but I think the difference is as five to seven in the expenditure of the materials on the soft and hard.

Do you mean seven on the hard and five on the soft?—Yes.

And yet the hard road is more open to the effect of the sun and air than the soft road?—It certainly lies higher.

But in forming a road over a morass, would you bottom the road with small or large stones?—I never use large stones on the bottom of a road; I would not put a large stone in any part of it.

In forming a road across a morass, would you not put some sort of intermediate material between the bog and the stone?—No, never.

Would you not put faggots?—No, no faggots.

How small would you use the stones?—Not to exceed six ounces in weight.

Have you not found that a foundation of bog sinks?—No, not a bit of the road sinks; and we have the same thickness of materials on the one as on the other.

If a road be made smooth and solid, it will be one mass, and the effect of the substrata, whether clay or sand, can never be felt, in effect by carriages going over the road; because a road well made, unites itself into a body like a piece of timber or a board.

In making a road under these circumstances, do you make the whole of the depth of materials at once?—No, I prefer making a road in three times.

Three different times?—Yes.

To what size would you break the hard materials?—To the size of six ounces weight.

Do you conceive that a more scientific system of management of roads is wanted universally?—I do.

Do not you conceive that the want of this scientific system leads to a great waste of public money?—I think it leads to a great waste of public money.

And also to a great waste of property in horses and carriages?—I think it does.

Has any estimate ever been made of the extent of that loss?—There can be no accurate estimate of a loss so universal as that of the waste of horses and carriages by bad roads; but the Committee of 1811 estimating the saving which would be made to the country by putting the roads in a proper state of repair, at a sum equal to five millions annually.



RIGA FLAX SEED.

*Letter from the Hon. T. H. Perkins.*

[To the Corresponding Secretary.]

*February 26, 1824.*

DEAR SIR,

WHEN in Ireland the last summer, I conversed with some of the venders of Flax seed, from whom I learned, that the growers of Flax preferred the seed from Riga before that of any other country—after that, the seed of Holland; and last

of all, what came from the United States;—of this last, the seed from the *State of New York* had the preference. Upon inquiry I found that the Dutch seed was preferred from being more clean from tares than ours, and that the inspection was more attended to in the *State of New York* than in Massachusetts—the whole import into Ireland, was 54,666 casks, of which 41,854 came from the United States, 10,882 from Holland, from Riga 2000 casks. The Riga seed commands in ordinary seasons 20 to 30*l.* sterling more than the Dutch seed, and the latter 10 to 15*l.* more than ours. An improvement had been made of sowing in the autumn, in place of the spring, as had been usual. On the 6th July I saw flax at Belfast, which had been sowed in October four feet and an inch in length—this I understood was from Riga seed. Believing that it might be of some importance to test the advantage of using the Riga seed, I requested the American Consul, Samuel Luke, Esq. to find me a cask of Riga seed, which has arrived at New-York, and is ordered here. It is at the service of the Massachusetts Agricultural Society. I wish, however, a portion of it to be reserved for my friend Gen. Derby, who resides at Londonderry, where I understand Flax is extensively cultivated—the remainder is at your service for distribution, and I hope it may prove a useful experiment.

Respectfully, Dear sir,

Your friend and servant.

T. H. PERKINS.

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LONG WOOLLED SHEEP OF THE NETHERLANDS.

*Letter from the Hon. T. H. Perkins.*

[To the Corresponding Secretary.]

*Boston, March 16, 1824.*

SIR,

I HAVE imported from the Kingdom of the Netherlands, a Buck and two Ewes of the long woolled Sheep of that coun-

try, which I hold at the disposition of the Agricultural Society. The staple of this wool on the full grown Sheep is fourteen inches in length, and as the carcass of the sheep is large, the fleece will be found to be large, in proportion to ours. Believing that this breed of Sheep would be useful to our country, and disposed to add my mite to promote the views of the Society, I hope they may be found to be acceptable to the Trustees. I am, Respectfully,

Your obedient Servant.

T. H. PERKINS.

The animals presented by the Hon. T. H. PERKINS to the Massachusetts Agricultural Society were gratefully accepted, as a highly valuable acquisition to our stock of sheep. The propagation of this race is important to the progress of the manufacture of blankets and worsteds, in our country. The Sheep are now in charge of Mr. ENOCH MOODY of Byfield, in the county of Essex, with whom they will remain a year or more.

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#### ON LINSEED OIL FOR FATTING CATTLE.

[To the Corresponding Secretary.]

Roxbury, May 7th, 1824.

DEAR SIR,

IN the spring of 1818 I purchased a large fine looking Cow, from the high recommendation of her former owner, as to her valuable milk properties; in a few days after she calved, and her bag was in so bad a state as made it necessary very soon to dry her up, losing the whole object for which I purchased her. Early in the fall having read, in "*Varlo on Husbandry*," published by an English Farmer in this country about 40 years ago, a Receipt as follows: "The quickest feeding a beast can take is *linseed oil* mixed with bran, if the animal is small, give two pecks of bran per day, divided into

three feeds, in each peck half a pint of oil, they eat it very greedily and it feeds them wonderfully fast ; they must have what hay they will eat, but that will not be much. The oil dilutes all the rest of the food they eat, and as to itself, it all stays in the beast, as to , five gallons and the bran in proportion will fatten a beast sooner than five pounds sterling in any other food."

I felt determined to try the experiment on the above mentioned cow—She refused the food for two days, but finding she had none other offered, she afterwards began to eat, and in a short time became fond of it ; she increased in fatness very fast. After using the 5 gallons recommended, I purchased two more, and then for about a fortnight gave her Indian meal, when she was in high order. And I sold her to a neighbouring Butcher, (having described to him the manner of feeding,) at nine dollars the hundred pounds, being the price of the very best beef at that time, the weight paid for was seven hundred and ninety four pounds. I never saw handsomer marbled meat, and he told me his customers were very much pleased with it ; and he has very frequently since told me they have often spoken of the goodness of that beef.

Two years after I fattened a pair of Oxen, one of which was by the same mode, consuming eight or nine gallons of oil, and afterwards meal for two or three weeks ; the other on vegetables and meal. I sold them to a Butcher from Halifax, Nova Scotia, for that market ; they were estimated at 1200 lbs. each—the oil fed one was thought the best, and the expense of feeding was considerably less. I gave this man notice of the mode of fattening both animals, he said he had no objection to the oil, as in England their cattle are fed largely on *oilcake*, and he should *bleed* this animal a few days before slaughtering. I heard from Halifax that the meat of both was considered excellent. Since then I have not fattened any beef animals, but was so well satisfied, that whenever I do I shall adopt the same method.



Mr. Parsons intends this season, fattening an animal by this method, when he will give the result to the society.

I am dear Sir,

Respectfully yours,

JOHN PRINCE.

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The oil cake, and linseed, ground to a powder, as well as the oil are much used for fattening cattle in England. The enriching of the manure by this means is said to be a sufficient object, were there no advantage in the first cost of the food. A jelly is likewise made from the linseed and mixed with barley meal or with bran and cut chaff.\*

There is said to be danger of giving a yellow tinge to the fat by keeping animals a long time on the oil or the cake.

*Marshall* in noticing the practice in the District of Maidstone, England, of grinding the seed for fodder says—"in the state of powder, it has no degree of clamminess and very little of tenacity; being perfectly dry, with an appearance like ground coffee. It might be perfectly or sufficiently mixed with the flour of pulse or any grain." He recommends this preparation as preferable either to the oil or cake.†

\* *Linseed Jelly.* The principal objection to this material is the trouble of preparing it. In an instance in which it was used with success, the method of preparing it was this. The proportion of water to seed was about seven to one. Having been steeped in part of the water, eight and forty hours, previously to the boiling, the remainder was added cold; and the whole boiled gently about two hours; keeping it in motion during the operation, to prevent its burning to the boiler; thus reducing the whole to a jelly like or rather a gluey or ropy consistence; cooled in tubs. Each bullock being allowed about two quarts of jelly per day or somewhat more than one quart of seed, in four days; that is about one sixteenth of the medium allowance of oil cake.—*Marshall's Gloucestershire, &c.*

† A large part of the flax seed which comes to the Boston market, is raised in New Hampshire and Maine, and most of what is grown within this state is produced in the southern counties.

## ON THE MANUFACTURE OF STRAW HATS.

[From the London Mechanics' Weekly Journal.]

[It will be recollected that a Miss Woodhouse of Wethersfield, in Connecticut, sent out to England in 1821, a bonnet of very fine manufacture, made from a grass growing in our fields (*poa pratensis*.) The straw plait was observed to be finer than a very fine specimen of Italian plait imported from Leghorn. Of several parcels of bonnet straw received in England from Italy, lately, some of them were recognised to be common grasses, and some of them oats, wheat and rye. It has been heretofore generally supposed that a particular kind of wheat straw was the only material used in the manufacture of the finest Leghorn bonnets, and that for want of this we could never manufacture bonnets equal in fineness and beauty to those imported. It appears now that this is not the case, and our countrywomen, we hope, will find themselves prepared to take advantage of any useful hints in the following account of the process in use in Italy.]

**T**HE Italian plait is said to be fine, when fourteen or more sewn together do not exceed four inches in breadth; they are called coarse if there are a less number than fourteen in the same breadth; but the manufacture of both is exactly the same.

The straw having commonly a more or less deep shade, it must first be bleached. For this purpose it is sometimes tied up in bundles, dipped in boiling water, untied and spread out to dry; if not yet white enough, it is put into a small closet or box, and some lighted brimstone being also put into the place, at a distance from the straw, the closet is shut up close for some hours. The bleached straw is then placed between two very damp coarse cloths, and left for three or four hours, that it may become sufficiently moist to be supple.

This being done, the knots are cut off, and the straw, unless it is to be used whole, is split lengthways by the point of a penknife, into three or four parts; they are then moistened again that they may be flattened, and form as it were little ribands; and are then, after being kept flat for three or four hours, ready to be plaited.

The plaiting is performed by the hand. It requires much attention, not only for the closeness but the regularity of the work. The female who plaits must keep her fingers constantly moist for otherwise the straw would lose its suppleness and flexibility.

In order to make extraordinarily fine straw hats, the straws are divided into a greater number of strips; but then the point of a knife can no longer be used. This division is performed in Italy by means of a row of very small fine needles, such as are used to embroider upon muslin; they are kept in their place by their heads being connected by rosin. On passing a strip of straw, (after it has been divided by the knife, and flattened,) between these needles, it is divided into several strips, much smaller than before, but not so fine as the strips of straw used for making flowers and other ornaments, which are divided in the same manner. The plait being thus made of a proper breadth and length, according to the work for which it is designed, is delivered to other workwomen, who sew it together by forming it into a spiral, and sewing the edges together, either merely touching one another or overlapping.

However well the plaiting of these hats is executed, they require to receive a finishing, which may give them an even brilliancy and regularity of surface. There are two methods for giving this final dressing to these hats:—the use of a press, and that of passing a heated iron over them.

For the purpose of pressing the hats, the plait is moistened either with rice-water, very thin starch, or weak gum-water, and dried; after which the hats are piled one upon another, with boards placed between each, the boards being previously well warmed; and the whole is strongly pressed, and left in the press for several hours, generally a day and night. The edges are first pressed, then the sides of the crown, and lastly the top of the crown.

The process with the hot smoothing iron is much quicker ; the hat is dressed with the mucilaginous dressing as in the other method, and is then run over with a heated smoothing iron of a proper shape. or with an iron box, containing either a mass of heated iron or a charcoal fire. Machines have been invented to accelerate the work.

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## ON DEAD LIME.

[From the London Mechanics' Weekly Journal.]

IT has long been observed by lime burners, that if lime stone is imperfectly burnt in the first instance, no further exposure of it to fire will produce quick lime ; but the philosophical chemists have doubted the truth of this observation. Mr. Vicat in a work however, which he has lately published upon mortar and stucco, has confirmed the observation of the lime burners. He found that in making quick lime in a small furnace, if the small pieces of lime stone which fell through the grate into the ash pit, before they were thoroughly burnt, were collected and again put into the fire, even for several successive times, quick lime was not obtained but a kind of lime technically called dead lime, which will not slake with water ; but which upon being ground and made into a paste with water, differs from common mortar by setting under water. When chalk is burnt, and the lime left to fall into powder by long exposure to the air, and then made into a stiff paste with water, it sets very sensibly under water ; so that the action of the air seems to produce a dead lime, similar to that produced by the incomplete burning of lime stone, as being neither pure quick lime, nor a complete carbonate of lime, but a kind of sub-carbonate, which possesses the new and useful property of setting under water.

Mr. Raucourt De Charleville observed the same effects to be produced as are described by Mr. Vicat. He also made

another observation respecting the production of a cement which sets under water. He had prepared a mixture of quick lime and clay and left it to dry ; some of this was then broken into small pieces, and burnt on a heated cast iron plate ; and another parcel in a small furnace, mixed with the charcoal used as fuel.

In these experiments it was observed that the pieces of this mixture of quick lime and clay, which were burnt on the heated plate, produced mortar that set under water ; but those burnt mixed with charcoal, produced a mortar which did not set under water.

Mr. Clement, when he gave an account of a mineral found by Mr. Minard in France, and which was fit for the making of hydraulic mortar or Roman cement, stated it to be Mr. Minard's opinion, that the cause of the Roman cement setting under water, was owing to a sub-carbonate of lime produced by the action of fire on the natural carbonate, as the chemists say, or in other words, to imperfect lime.

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#### EXPERIMENTS IN REAPING BARLEY, AT DIFFERENT STAGES IN ITS PROGRESS TOWARDS RIPENESS.

[From the Farmer's Magazine, published in England.]

SOME observations lately circulated by Sir John Sinclair, regarding the stage at which it is proper to apply the sickle to corn crops led to an experiment, of which the following is a detail.

A particular spot, in a field of barley having been selected for the trial, twenty-four stalks of grain, all as nearly as possible of the same size and state of advancement, were cut close by the ground, at different periods ; and each parcel being tied up and labelled, was suspended in a room. The following were the dates of reaping and the appearance of the plants when cut :

Aug. 11th.—1st. 24 stalks. The ear pretty well filled, but soft and quite green.

Aug. 18th.—2d. 24 stalks. The ear full and plump, but still green—grain soft and pulpy.

Aug. 25th.—3d. 24 stalks. The grain doughy, and no longer to be separated from the husk by pressure of the fingers.

Sept. 1st.—4th. 24 stalks. Grain still soft and doughy.

Sept. 6th.—5th. 24 stalks. The grain still soft and easily crushed between the finger and thumb.

Sept. 11th.—6th. 24 stalks. Grain still soft; but the field on the whole, in a state of ripeness, commonly esteemed sufficient; and accordingly this day it was begun to be reaped.

On the 10th of October, by which time the parcels were properly dried, the grain was carefully rubbed out, and subjected to an operation, equivalent to a complete winnowing.

The produce of No. 1, was found shrivelled and imperfect. And that of No. 2, little if at all superior.

With regard to these two parcels, they were cut when with a view to weight of grain reaping would be improper. It is presumable from their appearance, they would both vegetate; and it may be desirable to ascertain whether barley, reaped in the state of either of these parcels, might safely be used as seed; because if so, an evident advantage would arise from the additional value which the consequent preservation of its juices would give to the straw, while, perhaps, as seed the grain might go as far as when perfectly ripened.

The produce of No. 3, was also defective, being what is termed hungry; but not upon the whole unmarketable.

Nos. 4 and 5 had the appearance of maturity, but contained more light grain than No. 6.

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REMARKS OF THE PRESIDENT OF THE MASSACHUSETTS AGRICULTURAL SOCIETY AT THE BRIGHTON SHOW.

AT a meeting of the Trustees of the Massachusetts Society for Promoting Agriculture, at Brighton, October 21, 1824 :

“*Voted*, That the President be requested to communicate for publication, the remarks made by him previous to announcing the names and duties of the several Committees, at the Cattle Show, yesterday.”

ATTEST,

BENJ. GUILD, *Assist. Rec. Secretary.*

SOON after the first establishment of this annual festival, the Trustees of this Society deemed it proper to excite the public attention by an annual Address. It seemed to be necessary to vindicate the establishment of such a celebration and Show, and to awaken the attention of our Farmers to the *importance* as well as to the *defects* of their interesting pursuit. Our fellow citizens, when called to any public meeting, have a strong desire of being amused and instructed. Our country, from its very constitution, its reasoning and thinking habits, demands on all such occasions intellectual exercise. No nation, if we except ancient Greece, was ever so much addicted to the pleasures of the understanding. If their taste for knowledge has not been so much refined as that of Greece is said to have been, it is at least as ardent.

We can have no public meetings without speeches, orations, discourses, or sermons. To be sure, it must be admitted that some of these productions are often of inferior merit, but they still serve to stimulate the almost universal relish for intellectual enjoyment. They are the best possible proof of a general thirst for knowledge. If these productions are sometimes indifferent, they are censured or forgotten. But whether good or bad, they accustom our citizens to think and to reason, to condemn or to praise.

It has been found however by experience, that there is neither the necessity, originally presumed, for such addresses upon this occasion, nor the time requisite for them, consistently with the laborious duties of the day. It is no longer necessary to justify these exhibitions, since fifty millions of men in Europe and America have sanctioned them by their adoption. If public opinion is any test, (and we can scarcely find a better in an enlightened age,) it is now settled, that these exhibitions of agricultural productions and of manufacturing skill are eminently useful.

To the ancient world,—to Greece and Rome in their best days,—such exhibitions were entirely unknown. How could it be otherwise when the Farmers were slaves, whose condition was very little better than that of the black population of the West India Islands? The knowledge of the agricultural art was confined to men of wealth and letters. They dictated to their overseers, what course of industry their slaves should pursue. It is not more than half a century since the first experiment was made in any part of the world, of giving a stimulus to agricultural and mechanical efforts, by public *Shows and Rewards*.

There are at this day nearly as many public Shows in France, as there are departments,—about ninety—and there is, once in three years, a grand national exhibition at Paris, the list of whose premiums fills an octavo volume of 350 pages! What a strong proof of their supposed utility, in one



of the most enlightened nations of the world ! England has not so many, but they are numerous, and quite as efficient ; and the United States have at this moment nearly fifty public exhibitions of this description. And the trustees of the various Societies embrace some of the ablest men in our nation, including one of the late Presidents of the United States and many individuals, who have held, or continue to hold, offices of the highest rank in the legislative and judicial departments. It is therefore to be fairly inferred, that they are felt, and acknowledged to be eminently useful. It would be absurd to suppose that so many enlightened men in so many nations would have favoured a plan which was of small utility.

If it were needful to enter into details, we could easily show, that their *effects* have been fully as great as this universal approbation would lead us to presume. That the progress of agriculture and manufactures has been more rapidly promoted by these exhibitions, than by all the writings of cultivators from CATO and COLUMELLA to EVELYN, DUHAMEL, and YOUNG. Yet we would not be understood to undervalue *their* services. The connexion between science and practice is much more intimate, than mere practical men are willing to admit, or than some of them comprehend. The sailor, who is placed at the helm, and guides his ship safely in the darkest night, is little aware that he owes to GODFREY, an American, the instrument, and to NEWTON and KEPLER, and our own BOWDITCH, the principles, which enable him to cross a trackless ocean with perfect certainty of arriving at his distant port ;—and the mechanic, stationed at the power-loom, has very little conception of the depth of knowledge, and painful research of WATT, and ARKWRIGHT, and our own PERKINS, which have enabled him to accomplish in *one* hour, what, *unaided*, he could not have performed in a hundred hours.

Agriculture has none of these splendid achievements of

science to enroll. There is no short mode of making the earth productive, and of saving human labour. Perhaps it is best that none such should ever be discovered. It would diminish the number of persons devoted to that great and important art,—would of course lessen the class of citizens devoted to the most healthy employment; one which leads to the fewest temptations, and one which necessarily provides in every state, a healthy, vigorous, and uncorrupted population.

It would seem to my mind, I say it with diffidence, that no greater misfortune could happen to society, than the discovery of an art in agriculture, which should supersede the necessity of employing a greater number of men to support and sustain the minority. I fully believe that the purity, freedom and happiness of every nation are essentially connected with the necessity of employing the greater number in the innocent and untempting pursuits of agriculture. Such has been the sentiment of poets, philosophers, and statesmen in all ages; and under no form of government, does it appear to me to be so essential, as under one so truly republican as our own.

But though agriculture has not experienced any of those great changes, which have totally overthrown the *old* means of industry in the other occupations of man,—although we can neither plough nor sow by *steam*, nor by the novel combinations of the mechanic powers, yet agriculture owes much, very much, to men of philosophical research. Agriculture has always been much more of a science than our farmers are ready to believe. They sometimes sneer at “book-learning;” and it is precisely because they know too little of the history of their own art. The better they are informed, the higher the respect they will pay to philosophical inquiries into the processes of agriculture.

Even the most common articles which the farmer raises, were originally introduced by *theoretical* men. Who intro-

duced the Potato into Europe, which now furnishes subsistence to many millions of human beings? The gallant but unfortunate Sir WALTER RALEIGH—a man of consummate genius and great science, for the age in which he lived. Who transplanted the Sugar cane from India—and the Coffee plant? *Theoretical* cultivators. Who introduced the Cotton plant into our own country? *Theoretical* cultivators. That plant now furnishes nearly forty millions of dollars gross income to the people of the United States, and combined as it now is with our domestic manufactures, it may be said to be the greatest blessing ever bestowed on *our country*. Would any practical farmer have gone abroad in search of this valuable plant? Certainly not. Who introduced the Merino sheep—the Swedish turnip—the Mangel Wurtzel—the Millet—which now constitute so large a part of our productions, in the most improved States of our Union?

We need not enlarge. Agriculture owes as much to Science as its sister arts, though its progress is necessarily more slow, and therefore less perceptible; and it is much retarded by the jealousies and unfounded repugnance of some farmers to adopt any thing that is new. Within the last year we have seen a serious attempt to persuade us, that the English race of swine were little better in form than woodchucks, or in other words, deformed and miserable. Yet it is a well supported fact, that the improvement in the breed of these animals has been declared by the best judge in this State, because the largest purchaser and packer of pork, to be equivalent in value, to this State alone, to \$100,000. The same illiberal, because unfounded prejudice induced this opponent to allege, that the new breeds were *smaller* and *less productive*, while it is a fact susceptible of positive proof, that their weight at the same age is from 30 to 50 per cent. *greater*; and they have been so much more esteemed, that they have brought from 15 to 20 per cent. more for the same weight than the old races—and permit me to add also, to the

great gain of the purchasers, as well as sellers, for the extra money they paid was for consumable food, not for bone and offal entirely useless.

I advert to these prejudices, and I do it in the plainest and simplest manner, adapted to such a subject, because it is a duty early and constantly to meet and repel them. This Society is designed to be a *practical* one ; and our time is much better spent in plain, simple discussions of important facts, than in amusing our agricultural friends with polished discourses. If we do not encourage and promote sound principles in Agriculture, our Institution is worse than useless. It is a needless expense to the public.

To recur to the value and importance of these Shows. In what manner could we so rapidly or so certainly have brought home to the conviction of our farmers, the decided superiority of the fleeces of the Spanish sheep, as by contrasting them side by side with our races. To theoretical cultivators,—to HUMPHREY and to LIVINGSTON,—we owe their first introduction into the country. To the former, this Society at once voted its Gold Medal, though he was not a *citizen of this State*, and though this State had not then derived any peculiar benefit from their introduction. A strong example of public spirit in our predecessors, most of whom are gone.

Some years after, this Society, finding that the progress of this valuable race was slow, offered liberal and expensive premiums for the introduction of other individuals of the breed. The immediate effect was, the importation of numerous flocks at once ; and our country has thus gained, what it would be difficult to estimate, and what otherwise it might not have gained for half a century. If we have the patience, skill, and care of the Saxon farmers, we may in another half century add to the value of our products (including the profits on manufacturing the wool) perhaps a million of dollars annually to the income of New England.

But it is not simply in these plain and obvious particulars, clearly and indisputably produced by *public* encouragement, that we found our opinion of the value of *these Shows*. It is in the regular, manifest improvement of all descriptions of domestic animals from year to year. When Farmers are willing to pay five dollars for a cross, with a fine imported animal, they will take *better* care of the *progeny* ; and if it produced no other effect than *this*, the value of this excitement would be incalculably great. In short, is it possible, that in a free and enlightened country, when the minds of men are excited and turned to the improvement of their past practices in any one art, by all the motives which influence human action,—by self-interest, emulation, desire of public notice, that no valuable effects will follow from such an excitement ?

If it were so, it would show that we had arrived to the highest degree of perfection *before*, or that the same causes operating in the *agricultural* art, are incapable of producing the same effects, which are daily under our eyes produced in all the other arts.

If a man had been told, only twenty years since, that a single manufacturing company could turn out two millions of yards of cotton cloth, of a quality far superior to those produced by the successors of ARKWRIGHT, and (under the disadvantage of higher prices of labour) could afford to undersell the British manufacturer in foreign markets, (regard being had to value as well as price) it would have been thought absurd and incredible. I own that I was one who then deemed it such,—to my great personal loss.

We can show—our records will prove—that our progress in Agriculture has been full as extraordinary. This Society put forth, 20 years since, a set of queries to farmers in various parts of the state, touching every branch of farming, and the *quantities produced* of every description of agricultural products. The answers are in print, and are most valuable

documents. These replies, compared with the present state of agriculture, will prove, that the advancement in that art has been inconceivably great. The *highest crops* of potatoes were then stated at 200 bushels. We have granted not one, but many premiums—not to *one* part of the *State*, but to *many* portions of it, for the raising of from 400 to 600 bushels per acre. The highest quantity of corn raised upon the acre was *formerly* stated to be from 40 to 45 bushels. We have had almost innumerable claims for the production of from 65 to 116 bushels.

I am aware of the objections urged, that there may have been over estimates, and that these crops *cost too much*. Make what allowance you please for over estimates, (and they are always made under oath)—allow what you choose for the extra expense of producing great crops, yet they are proofs of zeal and intelligence, and they go far to convince the farmers, that one field well cultivated is better than *two* negligently managed.

What shall we then say as to crops *entirely unknown* as general crops only twenty years since? The mangel wurtzel, the carrot, the Swedish turnip, the common turnip, the common beet? These are the greatest triumphs of agricultural improvement in our country; no longer starving our cattle on the scanty and miserable produce of neglected and undrained meadows; on food, which might well suit with Indian ignorance and indolence, we have learned to store our cellars with rich supplies for our milch cows, oxen and sheep. No country has ever exhibited a more rapid improvement in these particulars. We have not yet extensively adopted the system of rotation in crops. That is still to come, and will inevitably follow the present excellent practice of raising with care, roots for winter fodder.

As to Horticulture, the field is *newly* explored. From a barren wilderness it has become a fertile garden. In my short space of residence in this mutable world, I remember

when the Mayduke and the sour Kentish Cherry could alone be seen in our market ; and there is not now a market on earth, better supplied than ours with every variety of the most delicious cherries. I remember when our strawberries were only gathered from the *grass* fields. I recollect the first boxes of cultivated strawberries ever sent to Boston market ; they are now in profusion, and of excellent quality, but still susceptible of vast improvement. Who ever heard of an English or Dutch gooseberry, or raspberry at market, 25 years since ? The Geniting, Cattern, Minot, and Iron Pears, some of them execrable, were often seen, but not a single delicious variety was known out of the gardens of the rich connoisseur. There never was a more rapid progress in any country than that which we have made in *Horticulture*, and yet there is no one point in which we are so defective ; I hope and believe, however, that we shall soon supply this defect.



## REPORT NO. I.

THE Committee on Fat Cattle, Bulls, and Bull Calves, beg leave to report, that it was with much regret, they perceived but one competitor for the premiums for fat cattle. It is indeed extraordinary, that in this grazing State, and in a market so well supplied as that of Boston with the choicest beef, such a case should *ever* occur. We are persuaded, that it arose from a general but very erroneous impression, which we have taken all the pains in our power to eradicate, that our premiums are given to the heaviest animals, and that it is vain to compete where it is known, that very extraordinary animals are to be sent. It was probably well known to the Western Graziers, that the two fine cattle from Shrewsbury were to be offered, and they presumed that they would carry the two first premiums.—Nothing could be

more erroneous than this opinion, and it is an error of great moment to the interests of agriculture.—Let it then hereafter be distinctly understood, that we have repeatedly granted premiums for fat cattle weighing 1800 pounds to the exclusion of others on the field which weighed 2000 and upwards. Our principles are, to give the premium for fat cattle not to weight only, but upon a combined consideration of form, aptitude to acquire flesh, distribution of that flesh in the parts which are most valuable for food, and smallness of offal. We take into consideration also, the mode of feeding. Other things equal, we give the preference to those which have been worked till within a short period before they are offered. We undertake to say, that a fine fat heifer weighing 1000 or 1100 pounds—or a fine steer of equal weight, whose forms were beautiful, whose flesh was profitable, and whose cost of fattening had been small, would have stood a fair chance of gaining one of the premiums against these fine large sized cattle. The real object of Agricultural Societies is, as it ought to be, to encourage the most profitable and least expensive mode of preparing fat cattle for market.

Having made these remarks, we owe it to the excellent farmer, who obtained the prizes to say, that his oxen were of the first class, as to form, and useful flesh, and tallow. They were excellent, and would be distinguished at any show in any country. To the honour of the candidate we would remark, that they were raised by himself, and were a fair sample of his own stock.

Although no one entered the lists with him, yet he ought not to suffer from this cause, because they were animals which fully deserved a prize.

We award therefore to Seth Wyman of Shrewsbury, the first premium of 25 dollars for his yellow ox, weighing 2452 pounds at 7 years old.

And the second premium of 20 dollars to the same person for his brown ox of the same age, weighing 2469 pounds.



In this case, it will be observed, that we preferred the smallest ox, and we have no doubt the butchers and consumers will prefer him.

We now come to the consideration of a part of our exhibition in which it is very difficult for the Committee to say whether pleasure or pain predominates or prevails. The pleasure regards the *public*, the pain *themselves*. It was truly grateful to those of us who have looked forward, as we have done, to the rapid improvement of our stock, to hear all our numerous visitors—many from our own state, others from neighbouring, and distant states—and others from Europe, speak in terms of the highest commendation of the exhibition of our bulls, and their young progeny, male and female. Out of thirteen bulls on the field, there was not one which could be called ordinary. These Shows have utterly banished that race of thick necked, and lean quartered animals, of *great* but *bad* proportions, which used to be sent to them, because they were much thought of in a remote circle. On this occasion the bulls were very fine, and the difficulty of selection was of course increased. To decide between two animals of the finest proportions is of course embarrassing, and it is very possible, that no other three persons would select precisely the same three animals. One fine point would strike one individual, and another would make an impression on a second. There is however one satisfaction in such a case, that you are sure the choice must fall on a good one. The experienced farmers who were associated with me, to my certain knowledge, anxiously examined every animal. I have been often associated with them, and it is but just praise to say of them, that more candid and more upright men could not be appointed to perform such an embarrassing duty. With these necessary and proper explanations, the Committee award the premium of 30 dollars for the best Bull, to Benjamin Harrington, of Princeton, 18 months old, of the Holderness and native breed.

The second premium of 20 dollars, to John M'Intyre of Needham, for his bull, 2 years old, of a native breed, from Westminster, called very improperly the Yorkshire breed. There is, we believe, no colour for this appellation. It is a small breed, existing in that part of Worcester county, most remarkable for the delicacy of its limbs—the roundness of its carcase—its disposition to fatten, and especially the almost unnatural size of its hind quarters. I cannot withhold my personal doubts, about the utility of propagating, too extensively, a race so very small. It is remarkable, that they preserve these characters and marks in whatever quarter of the country they appear. There was a beautiful bull of Mr. Boylston's, of Princeton, of the same breed, and another of the same race of H. G. Buttrick, of Westminster, a town, from which the first bull of this race was several years since, sent to our Show.

The 3d premium of ten dollars was awarded to the Hon. William Gray, for a beautiful bull by Cœlebs out of an imported cow, remarkable for the quantity of milk she gave. It was stated by the attendant who exhibited, that his dam had given from 20 to 30 quarts per day. It is well known, that she is very much distinguished as a milch cow.

There were many other extraordinary bulls; a very beautiful one exhibited by the Hon. Bezaleel Taft, of Uxbridge. A fine and beautiful bull exhibited by Mr. Watson of Princeton, of the same Yorkshire breed, which we should prefer to call the Westminster breed, being satisfied that it is purely native.

Dr. Chaplin exhibited a fine bull (Commodore) from Holderness and Fill Pail, shewing a marked resemblance to one ancestor as to colour, and the other as to form.

There was a noble bull presented by George Spurr, from Cœlebs, but he did not shew the finest points of his sire.

There was an excellent bull from Denton, exhibited by J. W. Hubbard, Esq. of Worcester.

There were difficulties, though not so embarrassing, as to bull calves.

We award the premium of 15 dollars for the best bull calf to Nathan Nichols, of Malden, from Cœlebs.

The second premium for the next best bull calf, of ten dollars, to Nathan Peirson, of West Newbury— $\frac{1}{2}$  Cœlebs— $\frac{1}{4}$  Fill Pail—and  $\frac{1}{4}$  Native.

The third premium to the Hon. John Welles, 5 dollars for a bull calf from Holderness, Cœlebs, from Bakewell.

We ought to observe that Mr. Welles exhibited a fine pair of twins, a bull calf and heifer, from Cœlebs out of a Bakewell cow, and one or two other fine heifers, of which, being Chairman of the Committee on that description of Stock, he could take no notice.

Mr. Prince presented a beautiful bull calf La Fayette, being almost wholly of French breed, Alderney and Norman. This race is not remarkable for flesh, but valuable for milk.

On the whole, it must be obvious, that Cœlebs has done much towards the amelioration of our cattle. His progeny are certainly fine. If Denton and Holderness do not exhibit as many at the Brighton Show, it may be, and probably is, owing to their location. It is too far to send them. Yet a Holderness, it will be seen carried the first premium, and neither of the Committee who decided, knew of what breed he was. This suggests to me the propriety of concealing the breed of the animals offered, till after the decision.

The animals presented by Admiral Sir Isaac Coffin were exhibited together. None of them except Admiral have yet had progeny. One of his calves, now owned by Mr. Derby, of Salem, gives us a right to expect, that he will be a most valuable addition to our stock.

The Herefordshire breed sent by Sir Isaac Coffin, is highly esteemed. It is certain that the heifer of that breed sent Admiral Coffin, is one of the most beautiful animals ever exhibited at our Shows.

Mr. Prince exhibited a *North Devon Bull*, probably of the same race with those which received so much praise from the Worcester county Society. On the whole, we have every reason to believe that we are in a fair way to improve our own native breed, not only by selecting the best of them, but by the propagation of those which have been most approved in Europe. We repeat what we have often urged on this occasion, that more is to be expected from excited attention to the improvement of our own stock than from importation.

JOHN LOWELL, *Chairman*.

NOTE.—From haste and indisposition, we omitted to notice several fine animals sent for *exhibition* only. If designed, this omission would have been unpardonable, since the Society and the public are much indebted to gentlemen, who, at their own expense, send fine objects, whether of nature or art, in order to increase the interest of our Show.

Gorham Parsous, Esq. exhibited the fine Alderney Bull, given to the Society by Mr. Hubbard, and bought by Mr. Parsons of the Society. He is much improved, and is a fine specimen of this valuable race. He exhibited also another fine bull and heifer of his own raising.

Col. Jacques, with his accustomed zeal exhibited Cœlebs, Yankee, and several other of that fine race, who are always sure to attract attention.

John Prince, Esq. exhibited a fine calf from Admiral, shewing that his stock are full worthy of the reputation of the Teeswater race.

There was a most beautiful bull of the same race imported by George Lyman, Esq. and sent for exhibition. We could not perceive that he was inferior in any point to the best of the breed. It is quite possible, that we may still have overlooked some which ought to have been noticed, but we trust that the confusion of the day, and the attention we are

obliged to show to strangers who are introduced to the Society, will be admitted as a sufficient excuse.

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## REPORT NO. II.

THE Committee on the subject of Agricultural Implements and Inventions, Report :—That six cast steel Hoes were entered by Z. and F. Bisbee, of East Bridgewater, in the county of Bristol. The invention consists principally in the eye of the hoe, which passes through the plate of it, and is rivetted all round, instead of on two or three sides, as in the common hoe. This conformation gives many advantages as from inspection is apparent. Their cost is seventy-five cents. Mr. Bisbee produced certificates that they had been used and approved by practical farmers, and were considered cheap, compared with other hoes, at that price. Considering the importance of the instrument, and the apparent utility of the improvement, the committee recommend a premium of \$10.

An iron Bit Stock was entered for premium, by Eleazer Smith, of Walpole, in the county of Norfolk. The instrument exhibited was extremely well finished, and displayed great ingenuity and excellence of workmanship. Its advantages were stated to be—that, being of iron, it was less likely to be twisted off by hard service—that the end of the stock, where it turns, is of tempered steel, to prevent wear by using; turning on a centre and neck of hardened steel; enclosed by a sort of box of iron, screwed together, so as to contain oil and a piece of iron, called the breast piece, which is applied to the breast or hand, in using, and which contains a screw of steel, for the centre to turn upon; the other end of this centre or stem is all of steel, and let into the stock by a square hole through it, with a nut counter sunk, so as to fasten that part together—the object aimed at being dura-

bility, ease of repair, handy use, and preservation of the oil. All these advantages, the committee apprehend, the inventor has effected; and if, as he states, it may be afforded to be made for five dollars, and even cheaper than English steel bit stocks, it is a valuable improvement. Under all circumstances, the committee would have awarded in this case a premium, had it been an agricultural implement.

Mr. Joseph R. Newell, of Boston, presented also for premium two Straw Cutting Machines, invented by Charles Willis, the one with a vertical, the other with a horizontal wheel. The principles of the alleged improvement were the same, except so far as was necessary to accommodate the work to the different position of the wheels.

The committee are decidedly of opinion, from the inspection they have given of the machine with the horizontal wheel, that it is preferable to the other, and indeed to any other they have before examined or seen, in point of facility of working and strength of construction, although it wants the power of regulating at will the length of feed, which is effected by Mr. Safford's machine, to be next described. The cost of this machine is stated to be from twenty to forty dollars. The committee recommend a premium of \$15.

Mr. Noah Safford, of Springfield, Vermont, also entered an improved Straw Cutter for premium. The principal advantage of this machine over the preceding, was in the power of regulating the length of straw or hay to be cut at pleasure, by means of cogs of different diameters.

All these machines had very satisfactory recommendations; and although the preference given to Willis' machine, with the horizontal wheel, was decisive with the committee, yet the circumstance stated relative to Safford's machine, they considered as an unquestionable improvement; and combined with that of Willis', would approximate to a very perfect instrument.

Considering the great zeal and labour Mr. Safford has ex-

hibited in improving this instrument, and his success, the committee recommend a premium to be awarded to him of \$10.

Josiah Jaquith, of Brunswick, State of Maine, entered for premium a Corn Sheller, of a new construction,—consisting of a cylinder of cast iron, fourteen inches in height, with a perpendicular shaft passing through it and terminating in a centre point at the bottom. The cylinder is ribbed at equal distances, set in motion by a cradle, and the operation greatly facilitated by a horizontal balance wheel. It did its work very perfectly, and the committee have no question in giving it a decided preference over any other before exhibited. Its price is twenty-five dollars. And they recommend a premium of \$10.

Mr. Jaquith also presented the same Threshing Machine, which was approved and to which a premium was granted the last year, on condition of his producing the requisite certificates. The committee however do not deem that the certificates adduced amount to such an evidence of use by practical farmers as their rules require. Whenever such evidence be adduced, if within six months, Mr. Jaquith will be entitled to a premium of \$20.

An improvement on the Ox Yoke was entered by John Mears, of Dorchester, county of Norfolk, with certificates of its being used and approved by practical farmers. The improvement consists in a better adaptation of the form of the yoke to the neck of the beast, giving it a greater bearing by a sort of lip, on the back of the yoke, which can only work one way—and also in a greater extension of the bed and tips of the yoke so as to receive the bow into a bearing of six inches instead of two, as in common yokes. Although the alteration is very simple, yet in the opinion of your committee it is very important, considering the incumbent duty of every farmer to consult the ease and convenience of this

useful animal in performing his work. The committee therefore recommend a premium of \$5.

Messrs. Trumbull and Boynton, of Northampton, county of Hampshire, presented for examination and premium a Power Loom; an instrument of their invention, and which has already been admitted with great success in several of our most flourishing manufactories; weaving broadcloths as fine and cheaper than any other species of loom. The utility of this invention is unquestionable. The committee however do not deem it entitled to a premium, within the scope of their authority. Were it otherwise, they should award any premium in their power.

John Bicknall, of Buckfield, presented for premium a machine for grinding plaster, corn, or grain of any kind. This is a patented instrument, and its character may be best understood by the tenor of the specification of the patent, which is annexed, marked B, with certificates of its practical application.

Although the model presented would grind plaster thoroughly into the state of meal, yet as it was necessary that it should be reduced into the size of a nutmeg in order to pass into this model, the committee did not think they could award the premium offered for the best machine for pulverizing plaster. They cannot doubt, however, that it is capable of being improved so as to effect that purpose on plaster, in its usual state.

The model of this mill, and the evidence of its utility, show many and great advantages, and may, it is apprehended, ultimate in a change of the mode of grinding. The power used being, from the nature of the machinery, so much less than that used in mills of the ordinary construction. The committee deem the invention entitled to a premium of \$20.

Mr. Joseph R. Newell also presented a very excellent plough, constructed by Charles Howard, of Hingham. The



committee cannot doubt that it is a very fine plough; and, judging from its form and workmanship, inferior to no other. Your committee do not conceive, however, that it can be entitled to a premium, from any particular characteristic invention.

Two species of improvements in the mode of fastening window blinds were exhibited by Mr. Charles Willis and by Mr. John M. Dearborn. The committee could not hesitate in giving that of Mr. Charles Willis the preference. Both, however, they consider useful improvements.

Mr. Dearborn also presented a new constructed bedstead, which takes asunder with great facility, and seemed less exposed to harbour vermin than those of the usual construction. Your committee, however, have not deemed either of these last inventions as entitled to more than a respectful notice, they not being in any sense agricultural implements. All which is submitted by order of the committee.

JOSIAH QUINCY, *Chairman*.

*Brighton, Oct. 21, 1824.*

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REPORT NO. III.

THE Committee "On Cows, Heifers, Sheep, Swine, and imported Sheep," consisting of Messrs. John Welles, Timothy Walker of Charlestown, and Abner Wheeler of Framingham, Report :

That the Cows presented for premium, though several of them fine animals, were not yet in such number, nor some of them of such properties, as, in the opinion of the committee, the country can exhibit. Something more seems due to the liberal encouragement offered by the Society, as well as to that unquestionable state of improvement, which has taken place in our Cattle. Our farmers must recollect, that upon their zeal and cooperation in a display of fine animals, the

utility, effect, and character of Agricultural Associations must, in a great degree, depend. Their spirit must therefore be relied on, in prospective, that when their aid is needed, they will not hold back, from fear of disappointment, or any other motive, from what is due to their own reputation, that of their friends and associates, or to the State, whose liberality and encouragement is generously imparted.

From the number of Milch Cows presented, your committee award the several premiums, as follows :

To Luke Fisk, Esq. of Waltham, for a fine Native Cow,  
8 years old, - - - - - \$30

Satisfactory evidence was offered that from this Cow was made twelve pounds of butter per week.

To Jacob W. Watson, of Princeton, for his Milch Cow,  
6 years old, of native breed, - - - \$20

Satisfactory evidence was given of her having given over 18 quarts a day ; her Calf, from Denton, at her side, in fine flesh and of good promise.

One half of the third premium to the Rev. Samuel Rip-  
ley, of Waltham, for his Cow, of native stock, \$7 50

In the winter season, this Cow afforded an average of nearly seven pounds of butter per week. It was to be regretted, that in a more favourable season, and when her milk was of much greater quantity, from its use in the family, no examination was made.

To Isaac Bemis, of Watertown, for his Native Cow,  
the other half of the third premium, - \$7 50

This animal was of good appearance, and her excellence as a Milch Cow was well supported.

#### MILCH HEIFERS.

To Mark Vose, of Watertown, for his Heifer, one quar-  
ter Cœlebs, the first premium, - - \$15

Her properties for milk were promising, and her form very good.

To J. A. Cunningham, of Dorchester, for his Heifer,  
the second premium, - - - - - \$10

The dam of the Bakewell breed—the sire a half blood  
from Cœlebs. This was a fine animal.

For Heifers not having had a calf:

To Benjamin Harrington, of Princetown, for his Heifer,  
18 months old, from Holderness, weighing 1096 lbs.  
the first premium, - - - - - \$12

To David Wait, of Charlestown, for a half blood heifer,  
from Cœlebs, the second premium, - - - - - \$10

To Jacob W. Watson, of Princeton, for his heifer of  
native stock, 18 months old, the third premium, - 8

To John Ellis, of Brighton, for his heifer, 1 year old,  
the dam of native breed, the sire, Holderness, the  
fourth premium, - - - - - 6

Your committee were particularly gratified with the stock  
presented for *exhibition* only. That sent to the Society by  
the liberality of Sir Isaac Coffin, as well as that shewn by  
Mr. Heard, Mr. Parsons, Major Jaquith, Mr. Pierce and  
others, was an interesting addition to the Cattle Show.

#### MERINO SHEEP.

Only one flock of Merino Sheep were presented for exhi-  
bition, and your committee have to lament, that this species  
of animal, which has surmounted prejudice, and is so useful,  
important, and indispensable to our manufactures, should be  
so feebly and insufficiently represented, notwithstanding the  
expense and public spirit with which it has been introduced.  
There can be no doubt that the extension of this race will  
follow, to which our climate appears well suited. But much  
of their improvement will depend on such comparisons and  
general knowledge as is derived from an annual exhibition,  
and an assemblage of farmers who take an interest in this  
stock. It would indeed be a source of regret if the liberal  
premiums offered by the Agricultural Society of Massachu-

setts, with the best motives, should fail to produce stronger evidences of the multiplication and improvement of this race.

The committee award the first premium to Joseph Bar-

rett, Bsq. of Concord, - - - - - \$20

Major Barrett produced a Saxon imported Ewe with his flock, and the latter did not suffer by comparison.

For the second premium on sheep there was no claimant.

The first premium for a Merino Ram, and the second premium for ditto, were not awarded. The committee thought that those exhibited did not deserve them.

#### SWINE.

*Boars.*—The committee award the first premium to

John H. Loring, of Groton, for his boar, 5½ months

old, - - - - - \$12

Second do. to Silas Dudley, of Sutton, for his boar, 8

months old, - - - - - 8

Third do. to James Lovell, of Newton, for his Boar. 5

*Sows.*—The first premium to S. W. Pomeroy, Esq. - 12

The second do. to Luke Fisk, Esq. - - - - - 8

The third do. to Silas Dudley, - - - - - 5

*For Pigs.*—The first premium to Adam Morse,

Half the second do. to Isaac Miles, of Brighton,

The other half do. to Abiel Wheeler, of Concord.

Some Pigs sent by Mr. Manners, the British consul, for exhibition only, were very much admired.

Your Committee are aware of the desire of the Massachusetts Agricultural Society, to promote the interests of Agriculture and Manufactures, to which they devote themselves, and not only their own funds, but those afforded by a liberal and enlightened Legislature; and they trust that the well informed Agriculturists and Manufacturers of the State, will not fail to second these views.

On the whole, a constant improvement is yearly to be seen. But more and better evidence might be afforded, to

gratify those who delight in these proofs of the increasing prosperity of the country; and your committee are persuaded, that to produce this desirable effect, the public attention will not be appealed to in vain.

Per order,

JOHN WELLES, *Chairman.*

*Brighton, Oct. 21, 1824.*

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REPORT NO. IV.

The Committee on Manufactures award—

For Broadcloth—the first premium, to Slater & Howard, of Dudley, \$20

The second to the Bellingham Cotton and Woollen Manufactory, 15

Two specimens of Black Cloth from the Saxon Factory at Framingham, were offered for exhibition only. It was considered a very beautiful specimen of Cloth.

For Household Cloth—the first premium to George M. Barrett, of Concord, 12

The second to Oliver Moore, of West Boylston, 8

There were five entries of Household Cloth, some of which would not discredit a professed manufacturer.

For Cassimeres—the first premium to Slater & Howard, 12

The specimens offered by them were of very uncommon excellence.

For double milled Kersey—the second premium to Tristram Little, of Newbury, 8

For Satinets—the first premium to Seth Bemis & Co. of Watertown, 8

The second to Trueman Clark & Co. of Walpole, 5

The Satinet presented by John Sampson of Plympton, would have been entitled to the second premium, had it been entered in season.

For Flannels of Household Manufacture—the first premium to Theodore Lyman, of Northampton, for a very beautiful specimen, \$10

The second to Elizabeth Jay, of New Braintree, 7

The coloured Flannels offered by the Ware Manufacturing Company for exhibition only, were thought very creditable to the company, and the colours uncommonly good. They were woven in water looms.

There were two pieces of White Flannel from the Amesbury Flannel Manufacturing Company, one of them woven by water power, which is supposed to save half the expense of weaving by hand. The use of water power for the manufacture of flannel is said, on respectable authority, not to have been yet commenced in Great Britain, and is an American invention. The Amesbury Flannels rival the best imported flannels.

For Carpeting—the first premium to Mrs. Gideon Delano, of New Braintree, \$15

The second to Mrs. Levi Goodale of West Boylston, 7

For Blankets—the second premium to Mrs. Cyrus Hubbard of Concord, 4

Mr. John Hunter exhibited the best specimen of Blanketing, of a very superiour quality. The article not being made up into blankets as required by the rule, the committee were unable to give him a premium.

For Diaper—the first premium to Mrs. John Hunter, of New Braintree, for the best wide Diaper, \$10

The second premium for wide Diaper to Mrs. Leah Coburn of Dracut, 5

For Linen Sheeting—the first premium to Mrs. Gideon Delano, of New Braintree, 8

The second to John Tower. of Cummington. 4

For Sewing Silk—the second premium to Emily Fitch of Hopkinton, 3

There was no specimen entitled to the first premium.

The tables were covered, as in past years, with a variety of substantial fabrics and fancy articles, not objects of specific premium. The committee recommend that the following sums be given as gratuities :

To Mary Stearns, of Waltham, for a Coverlet,	\$3
To Mary B. Withington, of Dorchester, for a Counterpane,	3
To Jane D. Grant, of Wrentham, for an imitation Leghorn Bonnet,	4
To Maria Hartwell, of Shirley, for do.	4
To Hannah Carpenter, of Norton, for a Dunstable Straw Bonnet,	4
To Elizabeth Hapgood, of Marlboro', for a Straw Hat,	3
To Lucy Ann Howe, of Hopkinton, for Needle Work,	2
To the Misses Wheelers, of Worcester, for a Specimen of Artificial Flowers,	2
To Percy Cobb, of New Braintree, for an imitation of English Cassimere Shawls—a new manufacture in this country,	4
To a young lady at Brighton, for a specimen of Silk Buttons and Frogs, equal to any ever imported,	3
To Naomi Abbot, of Boston, for a Lace Veil,	2
To Charlotte Brown, of Wrentham, for Artificial Flowers,	2
To Emily Francis, Harriet Josephine and William Jones, and Frederick Augustus Fisk, for specimens of Artificial Flowers, \$1 each,	4
To Miss Hannah M. Johnson, for a specimen of Silk Buttons and Frogs, and a Lace Veil, &c.	2
To Elizabeth P. Parsons, of North Yarmouth, for a Leghorn Bonnet,	4
To Mr. Battel, of Dover, for a specimen of Whip Lashes, of a very superiour quality,	2
To Prudence Howe Carter, of Leominster, for fine knit Socks,	3
To Triphena Smith, of Lincoln, for fine knit Stockings,	3

To Lucy Sprague of Bridgewater, for Worsted knit Stockings,	2
To Miss H. Green, of Lincoln, for a specimen of Cricket Coverings,	2
To Hannah Flint, of Lincoln, for Worsted Stockings,	2
To M. B. and C. L. Scott, of Boston, pupils at the Academy of Misses M. A. & S. Clark, for a beautiful Hearth Rug,	5
To Mary Manning, of Charlestown, for a Hearth Rug,	3
To Abigail Pomeroy, of Watertown, for a Hearth Rug,	2
To Sarah Robinson, of Newton, for a patch work Carpet,	2
To Patty Spaulding, of Natick, for a Hearth Rug,	2
To Ann Dalrymple, of Marlboro', for Dunstable Straw, and imitation Leghorn Bonnets,	3

Many others are deserving of respectful mention for the excellence of the articles of manufacture exhibited by them. Some of them probably do not expect a gratuity in money, and as respects all not otherwise noticed, the committee hope that an acknowledgment of their merit will be a satisfactory reward.

The specimens of Letter Paper and Folio Post exhibited by Andrew J. Allen, and manufactured at Leominster, were of excellent quality.

Several reams of Foolscap Paper, by Edward Curtis, of Pepperell, were also excellent.

The samples of Men's Hat's exhibited by J. M. Peck, of Boston, were in every respect of the best quality.

A specimen of Carpeting presented by Mary Robinson, of Worcester, Elijah Wood, of Concord, and Mrs. — Flag, were good fabrics, and creditable to the makers.

A Knit Carpet, made by Elizabeth Prescott, of Boston, is deserving of mention, as evidence of very commendable industry.

Two pieces of Bed Ticking by Samuel Slater, of Oxford,



were equal, if not superior to any of similar fabric in use in this country, whether imported or domestic.

The Lead Pencils exhibited by J. Thorough & Co. were superior to any specimens exhibited in past years.

The various articles manufactured from the milk weed, the Boots and Shoes presented by Abel Moore, of Concord, and many other small parcels of fancy fabrics not before noticed, were very creditable to those who exhibited them, and added much to the respectability of the Show.

The committee noticed a beautiful imitation Leghorn Bonnet, by Miss Selina Parker, of Fitzwilliam, N. H. sent to enrich the Show.—Also, samples of double gilt and single gilt Buttons, made at Waterbury, in the State of Connecticut, by A. Benedick, having every appearance of the best quality of imported buttons.

RICHARD SULLIVAN, *Chairman*.  
JOHN TAPPAN,  
E. TUCKERMAN,  
JOHN LEMIST.

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REPORT NO. V.

THE Committee on Agricultural Experiments, to whom was also committed the inspection of sundry articles of Manufacture, for which premiums were offered, REPORT :—That five parcels of Cheese, of more than one year old, and thirteen parcels of new Cheese, were offered for the Society's premiums, all of it from New Braintree, in the County of Worcester, a town for several years past, much noted for making and sending excellent Cheese to market—that offered for premium the present year, although apparently well made, yet for the most part is destitute of that rich and fine flavour necessary to constitute the best cheese for the

table;—an unpleasant taste was perceivable in some of the cheeses, which perhaps may be attributed to the food of the cows. Of the old cheese, that from the dairy of Mr. Job Rainger, was considered by your Committee to be the best, and is entitled to the premium of ten dollars—that from the dairy of Mr. Elisha Matthews, the next best, and is entitled to the premium of five dollars. Of the new cheese, that from the dairy of Mr Samuel Mixter, was adjudged to be the best, and is entitled to the premium of ten dollars—that from the dairy of Mr. John P. Nye, the next best, and is entitled to the premium of five dollars.

Seven parcels of Butter were entered for premium, some of it of a very good quality; but much of it deficient in a most essential point in making good butter, that of sufficiently working it over until the butter-milk shall be as completely, and fully as possible expressed from it,—that from the dairy of Mr. Michael Crosby, of Bedford, in the County of Middlesex, was considered to be the best, and is entitled to the premium of fifteen dollars—that from the dairy of Mrs. Luke Bemis, of Watertown, the next best, and is entitled to the premium of ten dollars.—Mr. Stephen Hastings, of Sterling, in the County of Worcester, is entitled to the premium of seven dollars, for the next best. Your Committee take this opportunity to observe, that the common glazed pots, or jars, are by no means the best vessels to be used for this article; the glazing imparts a deleterious quality to the butter.

Mr. William Earle, of New Braintree, offered specimens of Butter, and Cheese, both of which are of good quality—the Cheese, in the opinion of your committee, the best offered the present year; and Mr. Earle would have been entitled to the first premium on this article, had it been separately offered for the premium, and had not the rules of the society interdicted the awarding two premiums to the same person for the same article—the Butter and Cheese were made be-

tween the 15th day of May and the first day of October, from eleven cows, fed exclusively on grass—the entire quantity of cheese being 3797 lbs. ; and of Butter 143 lbs. ; and said Earle is entitled to the premium of twenty dollars.

Five samples of Currant Wine were entered for the Society's premium—that offered by Mr. John Heath, of Roxbury, is considered the best, and is entitled to the premium of ten dollars—for the next best, Mr. Emerson Fay, of Watertown, is entitled to the premium of five dollars.

For the best barrel of Cider, your committee recommend that the premium of fifteen dollars be granted to Colonel Daniel Leland, of Sherburne, in the county of Middlesex—no cider sufficiently good to be entitled to the first premium offered for this article, having been exhibited.

Two Hives well stored with Honey, were entered for the Society's premium, by Mr. Ebenezer Withington, of Dorchester, to whom your committee recommend to be paid ten dollars. His method of excluding the bee moth from the hive, will doubtless be published in the Society's Journal. A Glass Hive, containing about fifty pounds of Honey, of the very first quality, was exhibited by Brig. Gen. Dearborn, of Roxbury, accompanied with the following communication :—  
“The Glass Hive was placed over a wooden one, having a hole in the top, into which a swarm had been put in June, 1823. Last June the young swarm gave indications of leaving the wooden hive, but in a few days commenced filling the glass one, which they accomplished in 22 days, and then swarmed. They were put into a wooden hive, and a glass one placed over it for the young swarm to fill the next season. Only three bees were found remaining in the glass hive the next morning after the bees swarmed.”

Some large roots of the Mangel Wurtzel, white Sugar Beet, and Russian Radish, were exhibited by John Prince, Esq. of Roxbury, who also sent to the Society's Hall a few ears of corn, from seed received from Mr. Skinner, of Balti-

more, called Waugh Paugh Connetta, of dark mixed colours ; from two to six ears are usually found on a stalk ; it is stated to be a very great bearer, and ripens early. Mr. Prince also exhibited some ears of early golden Sioux Corn ; it was fit for grinding on the 10th of September ; is very valuable on account of its early maturity, and yields well.

Mr. William Ackers, also exhibited some large ears of Yellow Corn--and the Hon. Richard Sullivan sent from his farm in Brookline, some very large roots of Mangel Wurtzel. Some Mustard, in canisters and bottles, manufactured by Mr. Bickford, of Boston, was entered for exhibition, and found on trial to be of a very excellent quality. Four parcels of Calf Skins, and three parcels of Sole Leather, were exhibited at the Society's Hall ; the former appeared to be extremely well dressed. No premiums were offered the present year for the article of leather.

THOMAS L. WINTHROP, *Chairman*  
ISRAEL THORNDIKE,  
WILLIAM PRESCOTT,  
BENJAMIN GUILD.

*Brighton, Oct. 21, 1824.*

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REPORT NO. VI.

THE Committee on the Ploughing Match with two pair of Cattle, consisting of John Prince, *Chairman*, Ichabod Nichols and Francis Winship, Esqrs. report as follows :

That 7 ploughs were duly entered.

No. 1.—Freegrace Marble, of Sutton—plough made by Hall, of Sutton, with a wheel, and cattle four years old ; ploughman, Holland Marble ; Driver, Freegrace Marble ; turned 34 furrows, performed in 68 minutes.

No. 2.—A. D. Williams, Roxbury—plough made by War-

ren, of Dedham, with wheel and cutter—Cattle four years old ; ploughman, D. Parmenter—driver, D. Howe ; turned 30 furrows, performed in 60 minutes.

No. 3.—S. Williams, Roxbury—plough by Warren, of Dedham, with wheel---cattle four years old ; ploughman, Stedman Williams---driver, Thomas A. Clarke ; turned 32 furrows, performed in 63 minutes.

No. 4.—Charles Howard, Hingham—plough by himself, with wheel---cattle eight years old ; ploughman, M. L. Gerry---driver, John Langley ; turned 30 furrows, performed in 53 minutes.

No. 5.— — Hawes, of Roxbury---plough by Warren, of Dedham, with wheel and cutter---cattle seven years old ; ploughman, L. S. Bliss---driver, G. W. Badger ; turned 30 furrows, performed in 57 minutes.

No. 6.—Silas Dudley, of Sutton---plough by Warren, of Dedham, with wheel and cutter---cattle five and six years old ; ploughman, Silas Dudley---driver, S. Marsh, Jun. ; turned 32 furrows, work performed in 63 minutes.

No. 7.—Stephen Marsh, of Sutton---plough by Hall, of Sutton, with wheels---cattle three years old ; ploughman, C. Morse—driver, H. White, turned 34 furrows, work performed in 62 minutes.

The committee on commencing their operations, gave very full and explicit directions that the cattle should not be hurried ; that the sole object of the committee was to have the work performed in the *best possible manner*, without regard to time ; and they have great pleasure in stating their opinion, that an equal number of competitors, on the same space of ground (say one quarter of an acre to each plough, in a tough green sward, of at least ten years' lea,) has not performed better work in this part of the country.

They have taken great pains in forming their judgment, and hope the public and the unsuccessful competitors will be satisfied with this award :

To Silas Dudley, their 1st premium	\$15
S. Dudley, ploughman	8
S. Marsh, Jr.	4
	—27
To A. D. Williams, the 2d premium	10
D. Parmenter, ploughman	5
D. Howe, driver	3
	—18
To C. Howard, the 3d premium	6
M. L. Gerry, ploughman	3
John Langley, driver	2
	—11

All which is submitted by

JOHN PRINCE,  
ICHABOD NICHOLS,  
FRANCIS WINSHIP.

The plough made by Warren, of Dedham, was afterwards tried by the Society's Dynamometre, and cut a furrow slice of 12 by  $5\frac{1}{2}$  inches, with a draught of 392 lbs.

The new cast-iron plough, made by C. Howard of Hingham, was of very fine work and workmanship; and it being of *cast iron*, the same number will always be of the same form; it cut a furrow slice of 12 by  $5\frac{1}{2}$  inches, with a draught of 392 lbs.

The large plough made by Warren of Dedham, cut 14 inches by  $5\frac{1}{4}$ , and required the draught of 560 pounds; this shows the great uncertainty in the form of *wooden mould-boards*. They all did fine work, and the sward was a very tough one.

JOHN PRINCE, *Chairman*.

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#### REPORT NO. VII.

'The Committee on the Ploughing Match (with one yoke of Oxen,) Report:

That the ground selected was divided into lots of exactly one eighth of an acre each.—The conditions of the work were, that it should be ploughed not less than five inches deep, and the furrow slice to be not more than ten inches wide.

Past years having shown that tolerably good ploughing could be accomplished in a comparatively short space of time, it was now the determination of the Committee, that the excellence and not the rapidity of the work, should be their criterion in awarding the premiums, regard being also had to the state in which the cattle came from their work, and to their general appearance.—They therefore allowed forty minutes for the performance of the task.

Sixteen teams started for the premiums, all, except one, with a driver. The Committee have great pleasure in stating that they have never at any Match witnessed so much good ploughing, the cattle so good, or under such complete management. The ploughs, generally, were excellent, particularly one made at Hingham.

They feel bound to give the ploughmen and drivers great credit for their attention to their instructions in not hurrying their work. The first lot was finished in twenty-five minutes, and the last within forty do.

They have awarded to Aaron D. Williams, of Roxbury, the first premium of fifteen dollars; to Lewis B. Barber, the ploughman, eight dollars, and to the same as driver, having no other driver, four dollars.

To Silas Dudley, of Sutton, the second premium of ten dollars; to the same as ploughman, five dollars; and to Joseph Dudley as driver, three dollars.

To Samuel Sibley, of Sutton, the third premium of six dollars; to the same as ploughman three dollars: and to Palmer Sibley as driver, two dollars. They regret that they had not a fourth premium to award to G. M. Barrett, of Concord, as they were much pleased with his work;—

and they cannot conclude without remarking that in the opinion of your Committee they all deserve great credit.

E. HERSEY DERBY, }  
 PAUL KENT, } Committee.  
 PAUL UPTON, }

Brighton, Oct. 21, 1824.

REPORT NO. VIII.

*Brighton, Oct. 21, 1824.*

THE Committee appointed to award the premiums to the best Working Oxen, have attended to the duty assigned them, and report as follows, viz :—

1st premium to Royal T. Marble, of Sutton, for his Cattle 4 years old	\$25
2d premium to Silas Dudley, of Sutton, for his Cattle 5 years old	20
3d premium to James Robbins, of Watertown, for his steers, 3 years old	15
4th premium to John Bigelow, of Sherburne, for his Cattle 5 years old	12
5th premium to Asa Cummings, of Sutton, for his Cattle 4 years old	8

A large number of the Cattle had been engaged in the Ploughing Match in the morning, and yet on trial of strength appeared as if beginning their day's work. The number of entries exceeded those of last year, and the cattle were considered as decidedly superior, affording some evidence that attention to Oxen, for farm labour, so strongly recommended by the Committee last year, has not been neglected. The Committee, although they awarded a premium to Mr. Robbins' steers, three years old, considered cattle at that age as too young for hard labour and a trial of strength which may



prove injurious. The Cattle of Mr. Stephen Marsh, of Sutton, three years old, were considered as very fine, and if not too early put to hard labour, will prove superior cattle. The Committee noticed with pleasure the Cattle of Luke Fisk, Esq. of Waltham. They were well trained, and in backing the load, equal if not superior to any. The cattle of Mr. Hathaway, from Marblehead, were considered good on the draft, but not so quick in their movements as some others—perhaps in a day's labour at hard work, they might have excelled. As premiums have been offered for working oxen since the establishment of the Cattle Show, the Committee were of opinion, that in future, Cattle under 4 years old should be excluded from an entry, unless a difference is made in the weight to be drawn, and their trial proportioned to their age.

All which is submitted by

GORHAM PARSONS,  
SILAS GATES,  
ELIJAH PERRY,  
DANIEL TENNY.

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REPORT NO. IX.

THE Committee on Agricultural Experiments submit for the consideration of the Board of Trustees the following, in addition to their Report dated the 21st day of October last, to wit :

That Mr. Austin Bryant, of Cummington, in the county of Hampshire, is entitled to the society's premium of twenty dollars, for having raised the greatest quantity of spring wheat, being thirty-four bushels and twenty-five quarts, on one acre. Mr. Bryant's description of his culture is as follows. "The lot on which the wheat grew is a gravelly loam, situated on an eastern declivity, and containing by

estimation one acre and a half. In September, 1822, it was broken up ; previous to that time it was in a worn out state, producing but little hay. In the spring of 1823 it was ploughed twice, manured with 44 cartloads of manure, and planted with Indian corn, the crop was rather ordinary, not exceeding 50 bushels. In April of the present year the land was again ploughed, harrowed, and cross ploughed. Previous to the last ploughing seven loads of barn manure were spread on about sixty rods of ground. On the remainder of the piece I spread twelve loads of leached ashes, and harrowed them in on the surface. On the 30th of April I sowed three bushels of wheat ; the wheat before sowing was washed in clear water, and rolled in lime ; after sowing, the ground was harrowed twice, and rolled. About the first of September I employed a surveyor to measure and stake off an acre, being the part manured with ashes, the part on which was spread the barn manure being much inferior in quality. The acre was reaped and threshed by itself. When measured the produce was found to be thirty-four bushels and twenty-five quarts ; the wheat was harvested on the 2d and 3d of September. Its weight is 61 pounds and  $\frac{1}{2}$  to the bushel. The expense of cultivation was seventeen dollars and fifty cents."

That Messrs. Tristram and Henry Little, of Newbury, in the county of Essex, are entitled to the society's premium of twenty dollars, for having raised the greatest crop of millet, on one acre, cut and cured for hay, being 2 tons, 15 cwt. 1 qr. and 20 lbs. "We took the first piece of land that presented, which was that described in No. 1. Vol. 8. page 29, of the Massachusetts Agricultural Repository in May, 1824. There were about three cords of manure spread and ploughed in. We would here remark that the said manure was on the lot previous to the millet crop being thought of, which was a coarse kind fit for a potatoe crop, which did little or no good, and of course was lost in part. After

once ploughing and harrowing, the seed was sowed the 4th of May, three pecks on the acre, which was harrowed in and afterward it was rolled. It came up immediately, but in consequence of the drought, or some other cause, the growth was very slow. The weeds came up and outgrew the grain, and early in July there was little else but weeds to be seen; we then mowed it all down, and left it to its fate, supposing the crop about lost; but in a few days the millet started, and grew surprisingly, and was in a few days the handsomest crop we had then growing; it was mowed the 24th of September, and housed October 2d, and weighed." Messrs. Tristram and Henry Little are also entitled to the premium of twenty dollars, for having raised the greatest quantity of mangel wurtzel, being 33 tons, 10 cwt. and 14 lbs. on one acre. "The soil is a clay loam: in 1823, about three fourths of the same was sowed with onions, and manured with about eight cords of compost manure to the acre; but it produced an ordinary crop of 400 bushels to the acre. The other quarter was sowed with wheat without any manure, which mildewed, and of course was small. In the fall of 1823, there were about 10 cords of compost manure drawn on the lot and put in a heap. Most of the said compost was drawn from the salt marshes when ditching the same; the other part was from the barn yard. In the month of April, 1824, the heap was thrown over, and well mixed. Between the 8th and 11th of May the land was ploughed and sowed in the following manner. After one deep ploughing the ground was furrowed two and a half feet apart, and the manure put in the furrows, and covered with a double mould board plough; a roller was then passed on the top of the ridges, and the seed dibbled in with the fingers over the manure about six or eight inches apart. In the course of the season they were thinned, and left from six inches to twelve inches apart in the rows. They were once hoed, and ploughed three times between the rows. The crop requires no more

labour from planting to harvesting than a crop of potatoes. They were harvested the 25th and 26th of October, and we had 31 loads and 24 bushels. Three of the average loads were weighed, the weigher's certificate will show the gross weight being 3 tons, 3 qs. and 20 lbs."

Messrs. Tristram and Henry Little are also entitled to the society's premium of twenty dollars, for having raised the greatest quantity of turnips, being 783 bushels on one acre. "As it respects their value, we think the same weight not much if any inferior to potatoes for fattening cattle, or sheep; and we are confident they can be raised at half, or less than half, the expense per bushel of a potatoe crop, and from experience we can say they leave the land clean and in good order for an after crop. We have uniformly raised the best crops of grain, and potatoes, after them. The present season we had a piece of land which contained one acre and eighteen and a half rods mowed, and after the hay was cured, which was the 10th of July, ploughed, manured, sowed, and cultivated, as is stated in No. 1, Vol. 8, page 29, of the Massachusetts Repository; began to harvest them the first of November, and finished about the 10th or 12th; and there were 874 bushels, equal to 783 bushels to the acre; the expense of labour about 22 or 23 days' work."

Messrs. Tristram and Henry Little are also entitled to the Society's premium of thirty dollars, for having raised the greatest quantity of Vegetables, (grain, peas and beans excepted,) for winter consumption on their own farm; the produce from 16 acres of tillage land is as follows, to wit.: 230 bushels of Indian corn, 40 bushels of barley, 12 tons of English hay, 2½ tons of millet, 400 bushels of potatoes, 1500 bushels of beets and mangel wurtzel, 920 bushels of turnips, 150 bushels of onions, (which were sold,) about two tons of cabbages and squashes, together with a variety of esculents, common to farms in general. The stock on the farm usually consists of 4 oxen, 10 cows, 25 sheep, one horse, and

about 6 swine. As to the value of roots for feeding stock, there is a variety of opinions; but from a number of years experience, we think them a valuable addition, and highly worth cultivating, comparing them with English hay; and we know of no better standard. In our opinion three tons of mangel wurtzel, or potatoes, of the two we value the wurtzel the highest, are equal to one ton of hay for feeding stock generally; but for milch cows we think two tons of equal value:—for feeding of store swine, mangel wurtzel is the only root that we know of which we can cultivate and feed to a profit. Six bushels of raw mangel wurtzel, we think equal to one bushel of Indian corn. In feeding swine, we make corn the standard. The value of English turnips for stock, excepting for milch cows, we think but little short of potatoes; but roots generally, in our opinion, are worth 10 per cent. more for fattening cattle, or sheep, compared with hay, than they are for winter consumption, except for cows that give milk. As to the expense of cultivating roots for feeding stock, we know of no material difference from our former statement in the Massachusetts Agricultural Repository, No. 1, Vol. VII. page 51. for a crop of turnips; the mangel wurtzel can be cultivated as cheap. As to the best mode of preserving them, we have tried divers ways, by pitting them, by putting them into the barn and covering them with hay; and by putting them into the cellar; the last mode we think the best.” Messrs. T. & H. Little have made the following communication on the subject of planting Indian corn in hills, and in rows:—“In May 1824, the land was ploughed plane, (as is our phrase,) for the culture of Indian corn. We think much ploughing before planting is not so necessary, as frequent stirring the soil after the grain is up and growing; the piece contained two acres; one acre was planted in hills, 3 by 3½ feet apart: the other part was planted in double rows, two rows 9 inches apart: then a space for the plough of 30 inches. The ploughing and plant-

ing were done as nigh together as was convenient, which was between the 10th and 20th of May; the seed was of one kind of the eight-rowed yellow corn, from three to five stalks were suffered to stand in each hill, and in the rows the stalks were from six to nine inches apart. The manure was alike, a compost, five cords were put in the holes in the hill part, and ten cords were put in the other, in the following manner:—Furrows were opened about three feet apart, and the manure put in those furrows, and the corn dropped each side of the manure in those furrows, and covered with a hoe. The lot was four times hoed, and the suckers were all destroyed on the row part. The stalks were topped the middle of September, and about that time the appearance of that which was planted in rows was so unpromising, (for it was not then out of the milk, and the fear of an early frost,) we commenced cutting it up and giving the corn to the swine, which we continued cutting occasionally until we had cut nearly one half; but the unusual warmth of the autumn caused our fears to be groundless. Between the 20th of October and 1st of November, the crop was harvested and husked, and the weight from that planted in the hills was 7750 lbs. net to the acre, and from the half acre planted in rows 4389 lbs. net. There was no perceptible difference in the crop between that which was cut early and that part weighed, as to quantity; 70 lbs. of ears made one bushel of corn after it was shelled at the time of harvesting. There was no material difference as to the expense of cultivating the above acre in hills from our statement in No. 1, Vol. VII. of the Massachusetts Agricultural Repository; that which was planted in rows was double of that in hills from the planting to the husking; and we suppose it will be so in shelling, in consequence of the smallness of the ears. The stalks or stover we value from the part in hills equal to one and an half tons of hay; that part in rows, to two tons. Nov. 15th, one bushel of ears was weighed; the weight of which was thirty-five pounds twelve ounces.”

That Mr. Leonard Hill, of East Bridgewater, is entitled to the Society's premium of twenty dollars, for having raised the greatest quantity of potatoes, being  $688\frac{1}{2}$  bushels, on one acre. "In the month of May last I ploughed a piece of moist stubble ground, of a deep soil, where I had raised a good crop of Indian corn the year before; I also cross-ploughed and furrowed it, making the furrows two feet eight inches apart. I then filled up the furrows with 60 loads of coarse manure, which I took from under my linters, where my cattle were kept in the winter, and which was full half straw and hay. Upon this manure in the furrows, I planted 38 bushels of the common long red potatoe, cutting the largest into two or more pieces, and placing them about 12 inches apart, which I covered with a hoe. After they were well up I ploughed and hoed them, each three times. In October they were dug and measured, and the amount of potatoes produced on the piece which contained one acre and no more, was  $688\frac{1}{2}$  bushels, as will appear by the certificate of the measurer. The expense of cultivating the above acre of land, digging and gathering the crop, &c. exclusive of manure, was twenty-two dollars and seventy-eight cents."

That Colonel John Wilson, of Deerfield, in the county of Franklin, is entitled to the Society's premium of twenty dollars, for having raised the greatest quantity of Ruta Baga, being 608 bushels on one acre. "In the spring of 1823, after my clover had got up to be good feed, I ploughed it in, after a few days harrowed it well. About the 15th of June I furrowed it in rows three feet wide, put twenty loads of barn yard manure to an acre in the furrows, and covered it pretty deep. I then with a hand roller 16 inches diameter, with three spurs in its circumference at 16 inches asunder, passed along the ridges to mark the hills for Ruta Baga; the spurs in the roller were about three inches long, and shaped like a Farrier's phlemes; after this the seed was dropped,

and covered by the hand, the ground being very dry at the time of planting, and continuing so for several weeks. Very little of the seed came up short of four weeks, and much of it never vegetated at all, so that from two acres I had but about 300 bushels. In hoeing this piece of furrowed land I found a joint harrow very convenient, for it would suit itself to the surface of the ground. I would here mention that in harrowing corn I have noticed a great defect in the work of the common harrow at the 2d and 3d hoeings, as the outside hindermost teeth tear away the hills, and probably injure the roots, at the same time leaving the middle of the row untouched. In April last I ploughed the same land on which I had Ruta Baga last year, and on a part of which I raised the crop now reported. After the weeds began to show themselves, I harrowed it to destroy them. On the first of June I manured, ploughed, and sowed a strip of the same land broadcast, with Ruta Baga seed, for the purpose of transplanting. After the plants were large enough to take up, which was about the first of July, I put on 20 loads of manure to an acre, and ploughed it in, after which I went over it with a brush-harrow to smooth the surface. The manure was of different kinds, some from the barn yard, some from the sheep yard, and some from the hogyard. I found the crop best where the hog manure was spread, where they stood in the bed where the seed was sowed and not transplanted. From the little experience I have had, I believe it is best to transplant Ruta Baga for many reasons; they are not liable to be choaked by standing too thick in the hills before they are pulled out; they are less in danger of being destroyed by worms. By ploughing the land just before transplanting there is much less trouble from weeds; the stalk does not run so high above the ground; the labour is less as it saves the first hoeing which is the worst. I cannot tell how much labour it was to transplant them, being at a convenient distance from my



house, it was done at mornings and evenings, and in dull weather; but I should think a man could set a quarter of an acre in a day, after the hills were marked, which a man would do in an hour. This was done with the hand roller previously mentioned, leaving three feet four inches between the rows. They were hoed twice; the first time a man would hoe a quarter of an acre in a day, and the second time something more; they were ploughed at both hoeings with a horse plough. The first time turned a light furrow from the rows, the second time to them. On the 9th, 10th, and 11th of November they were harvested, and produced 700 bushels, equal to 608 bushels to the acre; they were measured in a cart previously measured with apples for that purpose; they being large, I thought that would give fairer measure than the basket. The labour in harvesting is trifling; two men and two boys pulled and cut the tops of 300 bushels in two hours and an half, and carted the same to the cellar the same day. Two average cart loads of 25 bushels each were selected, and put into a separate cellar, and on the 23d day of November they were weighed; the 50 bushels gave 2634 lbs.; these probably gave less weight than they would average, as they were all large and would not pack so close. The measuring the cart, the harvesting, the measuring the crop, and the weighing, has all been performed by Cyrus Briggs and David Farnsworth. The entire expense of cultivating the one acre and twenty-four rods, was forty-seven dollars and fifty cents.

Stephen Longley, Esq. of Shirley, in the county of Middlesex, claims the premium of twenty dollars, for having raised the greatest quantity of Indian Corn, being 112 bushels and 21 quarts on an acre, but not producing the certificates made necessary by the rules of the Trustees, your committee are prevented from awarding to him the said premium. Mr. Longley's description of his culture is as follow:—"In the spring of 1823, I ploughed this piece of

ground as grass ground, and planted it with Indian corn, manured it in the hill as usual. I had a common crop, for ground managed in that way. In the spring of 1824 I split the hills on the same piece of ground two furrows in a row, then spread on the same 10 common cart bodies full of manure, a mixture of meadow mud and barn manure. In the fore part of May I ploughed it in, then furrowed out the ground about five or six inches deep, at the distance of  $6\frac{1}{2}$  feet; then strew manure, of the above description, 10 loads on those furrows; then covered this manure, by turning a back furrow on each side, which made the last furrow about 24 inches distant, in those two last furrows. I put twelve cart loads of manure, principally made from the hogyard, with meadow mud and straw for the hills, placing it opposite the intervals in each of those two last rows, thus  $\cdot\cdot\cdot\cdot\cdot\cdot\cdot\cdot$  being 20 inches in those rows, then planted it with Brighton corn, and put four kernels in each hill.

"In this way I raised 206 baskets of ears, and two of those baskets make one bushel and three quarts, equal to 112 bushels and 21 quarts of shelled corn, to the acre; and performed with about one third more labour than in hills; the corn weighed after being husked five weeks, 59 lbs. per bushel."

Colonel Joseph Valentine, of Hopkinton, raised thirty-one bushels and an half of spring wheat; and Payson Williams, Esq. of Fitchburg, five hundred bushels of potatoes on one acre. Mr. Nathaniel Davenport, of Milton, in a communication addressed to the Trustees, states that he raised about two tons of millet on one acre, and that he planted in the year 1816, one hundred apple trees on one acre; but he has omitted to exhibit the surveyor's certificates.

For raising the greatest quantity of Barley on an acre, not less than 45 bushels; for raising the greatest quantity of Rye on an acre, not less than 80 bushels; for raising the greatest quantity of Carrots on an acre, not

less than 600 bushels; for raising the greatest quantity of common Beets on an acre, not less than 600 bushels; for raising the greatest quantity of Parsnips on an acre, not less than 400 bushels; for raising the greatest quantity of Onions on an acre, not less than 600 bushels; for raising the greatest quantity of Cabbages on an acre, not less than 25 tons weight, free from earth when weighed; for raising the greatest quantity of dry Peas on an acre, not less than 30 bushels; for raising the greatest quantity of dry Beans on an acre, not less than 30 bushels; for proof of having produced the greatest quantity of dressed Flax raised on half an acre, not less than 250 lbs.; for giving satisfactory evidence on "Soiling Cattle," not less than 6 in number, and through the whole season, together with a particular account of the food given, and how cultivated; for making the experiment of turning in green crops as a manure, on a tract not less than one acre, and proving its utility and cheapness, giving a particular account of the process, and its result; for proving by actual experiment the best season and mode of laying down lands to grass; whether Spring, Summer, or Fall seeding be preferable, and with or without grain on different soils; for proving to the satisfaction of the Trustees the best mode of rearing, feeding, and fattening neat Cattle; for proving to the satisfaction of the Trustees the utility and comparative value of the Cobs of Indian corn, when used with or without the grain itself, ground or broken—no claims for premiums have been exhibited.

For the committee,

THOS. L. WINTHROP, *Chairman.*

*Boston, Dec. 15, 1824.*

## MEMOIRS OF THE PENNSYLVANIA AGRICULTURAL SOCIETY.

**A** VERY interesting little volume under this title, has been recently published by the intelligent, indefatigable and manly editor of the American Farmer. It seems that the Pennsylvania Agricultural Society sent to Mr. Skinner such communications as they had received, and which they deemed worthy of publication, which he has accordingly published. They are plain and practical. The book is beautifully printed, and the plates are superior to any thing of the sort in any agricultural work. They must have been expensive. It is not our purpose to review this work in the modern style of reviews, which is to insert the title page, and then to proceed to a dissertation, in which nothing or very little is said of the work itself. Our purpose is to recommend it to the notice of the reading class of farmers, by extracts, not so copious as to injure the sale of the work, but just enough to enable our readers to appreciate its merits. We make no apology for preferring these extracts to original matter. We hold very cheap that ridiculous jealousy of the editors of public journals, which leads them to reject an excellent article, which has appeared in another work, and to insert one much inferior. The object of all printed works should be the diffusion of knowledge, and that object should not be defeated by pride or jealousy. If Maryland or Pennsylvania should furnish sounder remarks than Massachusetts, there is no reason why the readers in Massachusetts should not see them.

The only objection which could be urged against such republications might be, that by such a course our journals would become mere echoes of each other, and that readers would thus pay twice over for the same matter. But this objection does not apply to our extensive country, and to works on agriculture. Their circulation is necessarily limit-

ed. far too limited, much more so than it ought to be, and, than, we fondly hope, it will hereafter be. Take it as work in question as an example. It is not probable, that it will reach more than one in twenty of the subscribers to the Massachusetts Agricultural Repository.

That we have not borrowed more extensively from the *American Farmer*, edited by Mr. Skinner, has been owing not to any jealous feelings, but because the subjects of the articles in that valuable paper are more adapted to the middle and southern states, than to our own. Some articles of culture, the tobacco and the vine, have no interest, and can have no application to the eastern states; and even as to those which are common to us both, there is such a difference of climate, of soil, of extent of farms, of value of labour, of the means by which that labour is performed, to wit, by oxen or horses, that very few of the articles could be read without much allowance for these differences, which are not entirely understood by the New England farmers.

These objections do not, however, apply with so much force to the remarks of Pennsylvania farmers: though their great staple, wheat, is not generally cultivated here, yet it is cultivated to a very considerable extent; and as to all other articles, our culture is very similar. Differences, and important ones, unquestionably there are. Milder winters, deeper soil, longer seasons, render the rules applicable to the cultivation of Pennsylvania, not directly and rigorously applicable to Massachusetts, New Hampshire, Vermont and Maine.

Still they may afford us much and valuable instruction; and as they are, on the whole, at least our equals, and in many important respects, our superiors, we ought to seek information from them—happy, if we learn something new, sure to gain if our own practices and opinions are supported by theirs.

We shall begin with some remarks of John Hare Powel, Esq. on the various breeds of Horned Cattle. This is a topic peculiarly interesting to New England. This must be our agricultural staple to the end of time. Horned cattle, sheep and swine, must constitute the great sources of revenue to our farmers. We give no opinion as to the soundness of Mr. Powel's opinions; we mean to hold an even balance between all the contending parties. This, however, we owe to Mr. Powel to say, in zeal, public spirit, industry and experience, he yields to no man.

He is frank, and sometimes strong in the expression of his sentiments, but he always states the grounds on which they are formed. Whether it be true, that there is so marked a difference between the Old Holderness or short horned breed, and the new Helderness or improved breed, we do not undertake to decide. Whether our own native races are the true Devonshire, or have been as much blended with other descriptions as he presumes, we will not undertake positively to settle; but we must express our belief, that our original stock was purely Devonshire. We do not believe, that for a century past, nay, for 150 years, there was ever introduced animals in such numbers as to effect the purity of the breed, till Mr. Vaughan introduced a bull of the Leicester stock; and we have good reason to think, that his progeny are not numerous. We believe that there are four times the number of descendants from Denton and Cœlebs and Holderness, all more or less of the improved short horned race, than there are from the former. In truth till within a few years our farmers were very shy of foreign breeds. We shall make one other remark, and then permit our readers to peruse the interesting remarks of Mr. Powel and others. We have as yet heard of no example of a yoke of *working oxen* of the short horned breed in our country. Till we see them in the plough or the waggon, we shall doubt whether they will ever be as active and useful as our native

cattle ; whether the cross may not produce animals that will unite the good qualities of both races, is still to be seen.

ON THE IMPORTANCE OF NEAT CATTLE TO OUR MANUFACTURES AND COMFORT—THEIR VARIOUS PRODUCTS, &c.  
BY JOHN HARE POWEL, ESQ.

*Powelton, Philadelphia county.*

DEAR SIR,

I HAVE the honour to present, various selections from European works, to establish certain positions, which have been assumed, in some of my late communications. In corroboration of the facts, which have been alleged, I produce for publication, part of a letter, from Major Rudd, a gentleman of high standing in Durham, distinguished alike, by his zeal and success, as an improver of Neat Cattle and Sheep.

I am aware, that it has been hinted, that too much discussion, has arisen, on the properties, of farm stock ; but I may object, that no subject is more interesting, and none more important to the husbandmen, and landholders, of the eastern, middle, and western States, than that which indirectly involves the application of three-fourths of the product of their labours, and of their lands. I apprehend, that not more than one-third, of *their* cultivated soil, is annually subjected to the plough ; that of its produce, except small quantities of hemp, and flax, the farinaceous parts of wheat, buckwheat, and a portion of rye and Indian corn for whiskey and bread, nearly the whole is employed for the nourishment of Neat Cattle, Horses, Sheep, and Swine.\* Thus, without regard-

\* In the best districts, there will generally be not less than one-half of the land employed in raising roots and green crops for live stock, and not more than two-thirds of the inferior soils are always under these crops and in pasturage. Probably not more than two-fifths of even the arable land, or ten acres in a hundred of the whole surface, produce crops immediately applicable to the food of man. The remaining ninety acres, after a small deduction

ing the immense forests, whence we derive our principal supplies of beef and mutton, and I should hope, ere long we shall receive the greater part of our wool.—I think it is evident, that to our population at least, it is worth some effort to ascertain, whether experience, has established, in the country, where they are best known, and by the standard, which every man can best comprehend, the superiority of one race of Neat Cattle, over every other, either original or *improved*.

If it shall appear, that, by the multiplication of this race, “the produce of beef upon a given extent, of land, would be nearly doubled”—the quantity of butter increased—the facility of procuring powerful oxen for draught, not lessened—and withal, that the amount of offal, would be diminished—the weight of flesh, and of fat, would be carried upon the proper parts, I trust it will not be contended, that the discussion is futile, or the premium absurd, which shall have brought this race, more generally into view.

No man will deny the importance of the animal, whose milk affords butter, cheese, and various combinations for his table—whose hide, gives leather for machinery, harness, and his shoes—whose hair, supports the plaster upon his walls—whose horn, bone and blood are employed in manufactories, or converted into articles constantly in use—whose tallow, and fat, are consumed in candles, and soap, necessary to his comfort, and health—whose heels, afford oil, valuable, in many pursuits—whose stomach even, constitutes an agreeable repast—whose tail is converted into a couch for his indulgence, or repose—and whose patient offspring, after having enabled him to reap the harvest from his fields, yields the most wholesome, and nutritious food for his frame, and finally by offal enriches the soil.

for fresh water lakes, are appropriated to the breeding, rearing, and fattening of live stock.”—(*Sinclair's General Report of the Agricultural State and Political Circumstances of Scotland*.—vol. 3, page 1.)



It appears by Bailey's Survey of Durham, that at Colling's sale in 1810, seventeen cows were sold for 2,802 pounds 9 shillings sterling—eleven bulls for 2,361 pounds—twenty-eight animals, thus produced \$22,948 67. That Major Rudd paid 400 guineas for Lady of 9 years—for Lily 400 guineas—for Peeress 170 guineas—for Petrarch 375 guineas; that Messrs. Wetherill & Co. paid for Comet of 6 years, 1000 guineas. Mr. Champion, and Col. Mellish have since paid 450 guineas, for the services of Charles, during 2 years. A regular record is kept, in the Herd Book, of the pedigrees, of the animals of pure blood. Although one hundred and forty breeders—130 bulls and nearly 3000 heifers and cows, are enumerated in this volume, it will be seen, by Major Rudd's letter, and by the prices, which I have paid, that their cost, continues to be as high, as it was ten years since.

If it were regulated by the caprice of men of fortune, it might be alleged, that fashion gave to them, a fictitious value; but as the practical farmers of England, sanction it by their purchases, and support it by their demands, it must be inferred, that after a trial of fourteen years, the animals possess the merit, which has been claimed. To show the interest, which they have excited not only in England, but in this country, I could mention the names of some of the most distinguished gentlemen of Massachusetts, one particularly, of Worcester county, who notwithstanding, the various, and important duties of his high public station, manifests, in his agricultural pursuits, the most extensive scientific acquirements, and in *their results*, New England matter-of-fact skill.\*

He observes—"Next to the merino sheep I consider the introduction of the Short-Horns, *in the blood of Denton*, as the richest acquisition to the country which agriculture has received. For the dairy and the stall I speak with the utmost confidence of their pre-eminence. From my three years old heifers I have calves of the most promising ap-

\* Hon. Judge Lincoln.

pearance, and greatly excelling any I have before seen. One of the heifers gives from 16 to 20 quarts of the richest milk by the day since calving; the other a little less from the circumstance of having been in milk continually for more than a year, but her milk is in no degree inferior in quality. The last season she gave eleven quarts at a milking with grass only. A heifer of three years with her second calf has not been dry since she dropped her first, having given four quarts on the morning of her second calving."

I have in my importations, and purchases, sought the stock of those breeders, who have regarded *the milking properties*, not less than the propensity to become fat.

Mr Curwen, who as the able promoter of the agricultural interest both in Parliament and his county, is generally known, evinces great anxiety for the dissemination of this breed. In his excellent report, to the Workington Agricultural Society, after reciting, the origin, of the different families, of Short-Horns, upon his estates, mentions those which, "IN UNITING THE TWO ESSENTIAL QUALITIES OF MILKING AND FATTENING are highly valuable;" and adds, "two heifers and a bull, were this spring forwarded to Thomas Law, Esq. at Washington; from friendship and connexion—as well as the desire to support the credit of my farming, the very best specimens were selected. The steers, which have been bred, and slaughtered, have been equal, *in quality of beef to any thing I could have expected or desired*. At two and a half years old they weighed from 80 to 85 stones of 14 pounds each, equal to 1120 or 1190 pounds," although reared in the usual mode, upon turnips, chaff, and straw. In mentioning the draught oxen on his farms, Mr. Curwen observes, "those which are now at the Schoose, were produced there, and are of the Short-Horn breed. William Eve, who has long been with me, and is accustomed, to the working of both *Devonshire* and *Herefordshire* cattle, is of opinion, that the Short-Horned, are quite *as quick as the former, and as powerful as the latter*."

I have for some time, bred from the bull, and an heifer, begotten in England by General, Mr. Curwen's best male, upon one of the heifers, sent to Mr. Law.

These animals, as well as my importations, from Mr. Wetherill, and some of those bred by Mr. Champion, have every claim to excellence which high pedigree can establish. Comet, Peeress, and Lady, sold to Major Rudd, and Mr. Wetherill, were the grandsire and grandams, of some; Charles, which had been hired, during two years, for 450 guineas, was the great grandsire of another. Mr. Wetherill states, that the animals, which he had sent to Mr. Williams and myself, were of his "*very best blood*"—these from Mr. Champion, have his highest commendation, and are fitted he declares, for "milking, and fattening." It must be observed that unless the pedigree be traced on *both sides*, the animal cannot be admitted, as one of pure blood. Some of the bulls and cows, which have been brought on speculation from England, are not worth half their cost. A flourishing account is given of Comet, or some celebrated bull, named as the grandsire; the sire if from a native cow, would, nevertheless, be not more in technical language, than an half bred, his offspring from a native cow would be a quarter bred calf, whose progeny, from a native cow, would possess but one-eighth of improved short-horn blood.

I am, Sir, your obedient servant,

JOHN HARE POWEL.

JONATHAN ROBERTS, ESQ.

*President of the Pennsylvania Agricultural Society.*

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*Marton Lodge, near Stockton on Tees,  
England, March 26, 1824.*

SIR,

I HAVE been honoured by your letter of the 15th ultimo, and you may be assured, that I have a great pleasure in giv-

ing you the information which you request. I have been for many years a zealous agriculturist, and friend to the improvement of the breeds of cattle and sheep.

I have long enjoyed the friendship and intimacy of Mr. Charles Colling, to whom the world is indebted for the breed of cattle called the improved Short-Horns. Residing at no great distance from him, I was in the constant habit of witnessing his experiments, and when his celebrated stock of cattle was sold, in the year 1810, I became the principal purchaser. From this circumstance, my name acquired notoriety amongst agriculturists, to which you do me the honour to allude. I perceive from your letter that you have visited this country, and I see that you are acquainted with the principal points, which are here considered to constitute symmetry in cattle. A small and fine head—a capacious chest—the shoulders lying back in the body—the ribs round and barrel like—the back straight from the neck to the top of the tail—the loins wide—the hind quarter long and straight—the twist full and deep—the bone small, and offal light: such are the principal points attended to, by the breeders in this country. To these points of shape must be added, the great essential of *good handling*. This, I observe, you do not mention in your letter.\* It was formerly not considered in this country, but has now become essential, since it has been discovered to be the *touchstone* as it were, or *index*, of the propensity to fatten. A knowledge of good handling cannot be communicated by letter, and is acquired only by practice. It consists in a peculiar feel of the flesh under the skin. The skin should be rather loose, and under it the flesh should feel rather soft, yet firm and elastic. When a beast has this peculiar handling, and has long, soft, silky hair, it indicates that propensity to become fat in a short time, which constitutes the peculiar merit of the breed. In

\* I have always regarded handling, as much as points.—P.

order therefore, to constitute a bull or cow of the highest order, we consider an union of fine form, with the above handling and silky hair, to be indispensable. It was from possessing this union, that the breed as improved by Charles Colling, became so celebrated and in such request, that his bull Comet was sold by public auction for one thousand guineas. The cattle as thus improved, become fatter and heavier at two years old, than the old breeds are at three, and even four years old.

The importance of this improvement to this island, can scarcely be calculated, for if this breed was every where disseminated, the produce of beef, on a given extent of land, would be nearly doubled.

If cows of the deep milking kind are wanted, where milk *alone* is the object, as is the case near the great towns, they must be sought for amongst the old breed. The milk of the improved short-horns is *richer in quality*, but less in quantity. An improved short-horned cow, will yield about eight or nine pounds of butter per week, avoirdupois weight. I have heard of cows of the old breed producing more than twenty quarts of milk per day, yielding about twelve pounds of butter per week. These, however, I believe are now very rare. I need not observe that the old breed are a perfect contrast to the improved short-horns, in form and handling. I believe they also consume more food.

If cows are wanted for the supply of milk alone, as in the neighbourhood of great towns, the deep milking old breed are of course the most profitable. If, on the other hand, a breed of cattle is wanted for the general purposes of farming, in countries where beef is in great demand, the improved short-horns are, beyond all doubt, the best. This, I hope you will consider, a fair and candid statement.

With respect to the price of my improved short-horns, as they are derived from the original improver, and consequently are genuine, and of the highest pedigree. I have never sold

any bull, cow or heifer of the genuine breed for less than one hundred pounds sterling per head. For this price I would deliver bulls, or heifers at Liverpool, warranted of the best pedigree, and of the most approved form, handling and hair.

I shall always be happy to give you every information in my power, and if you should ever revisit England, I should be happy to show you, that the old English hospitality is not extinct. We inhabit countries whose people are derived from common ancestors, and I cherish the sincere hope, that the inhabitants of both, will henceforward cultivate a cordial intercourse, and vie only in endeavouring to render good offices to each other.

I am, sir, most respectfully, yours,

BART. RUDD.

JOHN HARE POWEL, Esq. *Powelton, United States.*

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ON IMPORTED CATTLE--THEIR INJUDICIOUS SELECTION--DEVONS NOT GOOD MILKERS--SUPERIORITY OF NEW ENGLAND OXEN FOR DRAUGHT--THEIR EXCELLENCE NOT TO BE ASCRIBED TO DEVON BLOOD--HEREFORDS BETTER THAN DEVONS---WORTHLESSNESS OF ALDERNEY CATTLE--ROOT CROPS--PROFITABLE IN AMERICA BUT FOR PARTICULAR OBJECTS.

By JOHN HARE POWEL, Esq., in Answer to G. W. Featherstonaugh, Esq.

*Powelton, Philadelphia county, 1823.*

DEAR SIR,

I AM glad, that you who combine skill in practice, with every advantage, in scientific research, confirm the opinions I had formed, on the most essential points of your communication. Of the various animals called "Short Horns," to which you refer, very few are of pure "Improved Durham blood"--with some exceptions, there would not be much difficulty in showing, that they have *no claim* to the pedi-

grees or properties of the "*Improved race.*" Most of them have been selected near Liverpool, by cow-keepers, with regard rather, to the state of their udders, for the supply of milk on ship-board, than with reference to pedigree of their fitness to improve our farm stock. I have invariably found, that whether fed in the stall, tethered by a chain, soil'd in a wood, or left at large in the field, the pure "*Improved Durham Short Horns,*" consume less food, afford more flesh, lay on more fat, and yield more rich milk, than any race of cattle I have known—neither have I seen any *individual* of any other breed, uniting so many essential properties for the dairy, or shambles—nor has it been found, that my young stock, are more tender in the blasts of winter, or less hardy in the heats of summer, than the common cattle of the country. I have on the contrary thought, that their thick coats of silky hair, upon ample hides, rendered them after a generation or two, peculiarly fitted, to endure the sudden changes of our climate. *HOLDERNESSE*, or "*OLD SHORT-HORNS,*" were deep milkers, bad provers, great eaters, with heavy bone, thin skins, long legs and tender constitutions, and were marked by many of the defects, which betray some of the recent importations, as of a "*poor breed.*" The size of the improved stock, is not "*too great,*" for the ordinary purposes of our farms—and if it were, it would, by an immutable law of nature, which never ceases to affect, the animal, not less than the vegetable creation, in a few generations, be accommodated to the food, given for its support. Since the time of Colling, the various breeders of England have made crosses with the same race, to meet their particular purposes. I have had within a year or two, twelve imported animals, and I can exhibit I think in the best blood of Mr. Wetherill, Mr. Curwen and Mr. Champion's folds, some essential points, marked by the peculiar views of the respective breeders. Early maturity is not the least important, of the valuable properties of this breed. I had a

cow, which was four years old on the 21st of March, 1823; on the 8th of June following she had produced four calves at separate births. All her offspring are large. I think her quarters would weigh, notwithstanding her early bearing, 750 lbs.

Heifers should not receive the male before the end of the second year, except in particular circumstances, where it may be profitable, to sacrifice half-bred heifers, with the view of multiplying animals, more nearly allied to the pure blood. The secretions of milk, are certainly "augmented by milking carefully, and systematically, stripping every drop from the udder," but I have not found, the duration of a cow's milk, in any wise affected by the period at which she had been dried, previous to the birth of her young. Few cows allow their calves to suck longer than within two months, of the time of parturition. During the latter stages of gestation, the foetus requires, those portions of nourishment, from which, the secretions of milk, must necessarily detract. The increase of food, might diminish the evil, but it could not remove the cause of objection, since the animal system is capable but of limited exertion, which cannot be extended at will. "The wear and tear of deep milkers," is avowedly great; but at no time are their effects so evident and strong, as when the calf within, and the milker without, in violation of nature, are at the same moment exhausting the animal's strength. I would turn off all fine cows, two months before the birth of their young.

I should not select "Short-Horns" expressly for draught alone. I am not satisfied that the delicate Devons, which have been chosen for the *light soils of Norfolk*, are better suited to the yoke, than the vigorous and spirited bullocks, which are found in Massachusetts, Connecticut, New York, Pennsylvania and Maine. It has been asserted, and by authority, which I am always disposed to respect, that the cattle of Massachusetts are derived from Devons. In proof it is



alleged, that the inhabitants of that State had emigrated from Plymouth; and too, that the animals are, as in Devonshire, generally "*red*." I would ask, whether the ages, which have passed since the settlement of the colony, must not have produced, in a climate so different, under circumstances so opposite, and with management so distinct, a radical change in the form, disposition and properties of the ox, scarcely less marked, than in the propensities, habits and character of the man. I would contend, that the finest cattle in Massachusetts are mixed with families, of which Mr. Gore, Mr. Stewart, and Mr. Vaughan, imported the sires. Lancashire, Leicester, and Hereford blood, can be traced by a practised eye, in many of the best working oxen, exhibited at the New England Agricultural Shows. If colour determine the question, of Devon superiority, it is but fair to state, that from 100 yokes of the finest draught cattle of Massachusetts, which last autumn had been exhibited at the Worcester Show, the best, were taken to Brighton, where a pair of *very light yellow* oxen, received the premium, for *docility and speed at the plough*. On a former occasion, a yoke of black and white bullocks, received the reward. The most hardy, and active cattle, I have ever seen, had the shape of Kyloes, and were brown. I should ascribe the extraordinary performance of New England cattle, to the skill, sagacity, singular steadiness, and peculiar firmness of the men—to care in selection—and to the face of the country in which they are bred. A New England ox, as a New England horse, and New England man, is exposed to exertion from his birth—the hills upon which he must generally seek for his food, give health to his lungs, and vigour to his muscle, whilst the shortness and sweetness of the grass, properly nourish his frame, without loading it suddenly, or producing sluggishness under the yoke. I can conceive, no advantage, which is to be had, from the introduction of imported Devons, among our farm stock. Have any instances been brought, wherein

it appears, that in activity, patience or strength, they have in Great Britain, surpassed the oxen of Massachusetts, or New York ?

I have never seen in Europe, performance of oxen, comparable to that which in Massachusetts would scarcely be remarked.

Mr. Coke, in speaking of his favourite race, acknowledged "that difference of opinion must necessarily exist, yet on the light lands of Norfolk, Devons were allowed to excel." Have the rare Devons, for which we are indebted to the munificent and distinguished improver of Norfolk husbandry, shown extraordinary excellence in the secretion of fat, production of milk, early maturity, or weight in the valuable parts? They, no doubt, during six years, have had all that food, care and skill could effect, to make evident the vast superiority of this active and fashionable race, over the gross, heavy beasts, which we Pennsylvanians prefer for their vulgar hind quarters, productive udders, propensity to sleep, and grow fat. For certain purposes, I am not sure, that a cross may not be advantageously made. With this view, you have judiciously taken a small male—as theory and practice have established the belief, that he should be of the smaller family, to ensure proper nourishment to the *fœtus*, and good shape after birth. I have not succeeded, in attempts to improve with the Devon blood. The sire and dams, with which the experiments were commenced, had been imported. The size, temper, mellow handling, and "quick feeding," of the Short-horns, have been lost, whilst in the consumption of food nothing has been gained.

At the late Maryland Cattle Show, eighteen or twenty "three-fourths bred" bulls, heifers, and calves, immediately derived from the animals sent to America by Mr Coke, were sold by auction, at prices not larger than the common cows and calves of New England readily command. As the stock had not only been known but some individuals of it had been

possessed by many of the spirited and wealthy farmers who were present, it is to be presumed, a fair estimate of the value of Devons, for the purposes of America, can thus be had from a public sale. There have been several importations of Hereford cattle. Mr. Edgar, of Rahway, New Jersey, imported three years since, a beautiful Hereford heifer, and her calf. Mr. Clay has, with his accustomed liberality, extended in Kentucky, his fine Hereford stock. I should, with your views, select for a new cross, an Hereford bull, small of his breed, which possesses size and good points for the shambles, more tendency towards proof, as much bottom for the yoke, and as many properties for the dairy, as the Devons from which they have sprung, unless I could obtain one of the best animals from the great herds of Mr. Wadsworth, of New York. I have not seen at any of the Eastern shows, oxen to be compared to them, or to those from the South Branch of the Potomac, except for the purposes of the yoke.

Of the unthrifty, dwarfish, and savage race, called Alderney, I have for fifteen years had ample experience. I do not pretend, that *Norman* cattle, from which they were derived, are not thrifty and good; but I venture to assert, without fear of contradiction, by facts, that all the mistaken efforts, by which the unpractised, theoretical, agricultural teachers of this State have excited the surprise of humble, practical farmers, there have been few more unfortunate, than their recommendation of this wretched breed.

I am not disposed to question the usefulness of gentlemen farmers—those patriotic, enlightened, and liberal men, who by practice detect error, by science expound the theory, and by their generous exertions, and zeal, elevate the importance, and extend the influence of the most essential of all human arts—but I condemn, the flippant writers, and half bred philosophers, who would teach without knowledge, as they farm without land.

The readiest and “cheapest means of keeping stock,” must

depend upon climate, the circumstances of the farmer, the condition, and position of his land. Turnips, carrots, or mangel wurtzel are admirably adapted to some districts of our country, although, in most parts of America, their cultivation, is attended with so much uncertainty, and comparative expense, that they cannot be introduced, for the general purposes of the fold : nor should I conceive, that in any section of the United States, where Indian corn is a certain crop, they should be employed but for particular objects. I had tried, for five years, ruta бага, and for three, have succeeded with mangel wurtzel. I believe, I have had of both, quite as good crops as most farmers of this State. I found less difficulty in cultivating turnips, from my acquaintance with the European modes of management, and from my practice, of ploughing deeply, and obtaining by the use of scarifiers, fine tilth. Yet my turnip crops, generally disappointed my expectations, whilst my mangel wurtzel, which had been placed by their side, uniformly so perfectly succeeded, that I have confined myself to the cultivation of them alone.

I exhibited some of the cream, afforded by a cow fed upon mangel wurtzel, and millet fodder only, at a late meeting of the Pennsylvania Agricultural Society, when it was declared, by all the members who were present, to be equal in richness, colour and taste, to any cream they had seen. Its colour was very like that which is produced in June.

Some of my Short-horn heifers, which came fat from the meadows, were put with a native cow, which I had rescued from the butcher, on a bare field, in order that they might be sufficiently reduced, to calve safely. The native cow, became, although unusually fine of her kind, quite as thin as could be desired, the others have retained their flesh, and are now so fat, that I have been obliged to occasionally substitute, straw for millet hay, with the addition of a little more than a peck of mangel wurtzel, a day. I contend, that the fitness of any race of farm stock for the general uses of the country,

must be determined, by the comparative consumption of food—for it would be in vain, to recommend to American farmers, expensive beasts, which by their graceful forms, or large frames or fashionable points, attract the notice of unpractised or wealthy men, unless we can show that *less food* is required for their stomach, more butter is derived from their udders, more flesh from their loins, less offal with their bone, and a quicker return is made, by their early maturity, to the breeder's pocket.

It is a well-known fact, that in England, pure "Durham Short-horns" are fed during the first winter generally upon turnips and straw. Too much importance cannot be attached to the production of esculent roots, to a certain extent, for the promotion of health, and useful secretions of neat cattle and sheep. Half the diseases with which they are assailed proceed from indigestion or obstructions, occasioned by unwholesome dry food.

I am, dear sir, with great esteem,

Most faithfully yours,

JOHN HARE POWEL.

G. W. FEATHERSTONHAUGH, Esq.

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#### VINEYARDS.

[As the subject of vineyards is discussed with great interest in the American Farmer, and is attracting notice in this state, we thought the republication of the following articles might be useful, as the New England Farmer is not so generally taken as it ought to be, and its merits require and deserve.]

[FROM THE NEW ENGLAND FARMER.]

Mr. FESSENDEN.—There is a disposition in some of your readers, to commence the culture of the grape in vineyards. No doubt a country producing wild grapes plentifully will pay the labourer well for cultivating them. Where is the native rye? The native barley? We have none. Corn is

a native ; but we are no more confident of a crop of corn, than of rye or barley. Grapes are as certain as either of them. Gen. Humphreys, of Connecticut, the distinguished agriculturist who introduced the Merino sheep among us, has left it on record, as his belief, that *New England farmers could make more gallons of wine than of cider, from the same land.*

I hope a number of our enterprising farmers will plant vineyards the ensuing year. Numbers will strengthen each other in the new work, both with learning and experience.

The native grape is to be relied on. If better can be had, or a particular kind of native proves best, it is most easy to engraft or enlarge the vineyard. The natives are accommodated to the climate, and will, I trust, do great honour to the vine dresser.

Please inform, when convenient, Mr. Editor,—What is the best soil and site for a vineyard ? When is the proper time to cut and plant the slips ?

#### WORCESTER COUNTY.

*Mr. Lowell's Remarks on the above.*

THOMAS G. FESSENDEN, Esq. *Editor of the New-England Farmer.*

SIR.—You have requested my opinion as to an article sent to you from Worcester County, relative to the culture of the Grape in vineyards ; that is, as I understand the writer, the cultivation of the grape in Massachusetts, for the purpose of making wine. I respect your correspondent's zeal, but I feel so deep an interest in the success of all agricultural experiments in this State, that I should consider it a misfortune, if your paper, deservedly popular, because, in general, its articles are sound and judicious, and have contributed, and I hope will continue to contribute much to the advancement of agricultural knowledge and improvement, should advance

opinions, or encourage any course of agricultural industry which must ultimately fail.

The culture of the vine extensively for the purpose of making wine in any of the New-England states, I consider imprudent, and in the present state of our knowledge and experience, unwise.

So far as my experience (and it has been long continued) goes, all the varieties of the grape, from which any good wines are made, will not stand our frosts. In some favourable winters, they will survive, but even in the sheltered gardens of Boston they often perish, at least to the ground, and the shoots afterwards become so weak as to require one or two years to restore their vigour and fertility. Our usual course is to lay them down and cover them with earth. This labour, though considerable, is not however so great as to discourage the culture. But there are other dangers, and much more serious ones. The grapes which make good wines are natives of much better climates than our own—of climates in which the summers are much longer than those of the New England states. The grape in the south of France pushes out its foliage in March or the beginning of April. With us it seldom starts till the 15th of May, and in some seasons not till the last of that month. Frosts usually injure *our* grapes by the 15th of October, and in some seasons by the first of that month; and they are not ripe till that time. In the wine countries, the grapes are not injured before the 1st of November, though many of the grapes are ripe enough for the vintage by the 20th of September. Thus the wine countries have from fifty to seventy-five days' longer seasons. There is another difference equally unfavourable to our cultivation of the grape. Our seasons are much more variable. Though some days are as hot, others are extremely cold,—though the thermometer is as high at noon, yet its depression during the night is much greater than in the natural countries of the finer grapes. From this cause, these

tender grapes are subject to various diseases, particularly to what is called blight. This in sheltered gardens, under the eye and care of experienced gardeners, is checked or cured by various applications, and by the modern practice of girdling; but it is feared that these laborious and careful expedients could not be applied to vineyard culture, with ordinary skill, and at moderate expense.

I apprehend further, that could we ripen the Champagne grape, or even those of Burgundy and Bourdeaux, the wine made from grapes grown *here* would not be as good as that of those countries. There is not, I apprehend, enough of sugar or saccharine matter in grapes raised in Massachusetts, to make a strong bodied wine. Still less could we hope to raise the grapes which make the favourite wines which are imported into the United States, such as those of Spain, and Portugal, and their colonies.

It may be objected, that our climate is as favourable as that of the banks of the Rhine, and that we might hope to equal the Rhenish wines. Those of us who have been condemned to the punishment of drinking those wines, (for it is the only beverage in the countries through which that river flows,) would never consent to exchange our own cider and perry for them. Even the best of old Hock would not suit *our* tastes. It is not generally known here that there are *no* wines made near Paris which would be thought of any value by *us*.

But our experimental and enterprizing friends infer, that because we have grapes growing in our *own* woods, we can successfully raise vineyards and make our *own* wines. Let them begin by an experiment upon our own black and white grapes, with their tough skins, their acid and dry pulp, their peculiarly unpleasant flavour, when the skin is hard pressed, and if they can succeed in producing *one or two gallons* of wine, which will please the taste of connoisseurs, or even acquire a preference to well manufactured cider, let them then cautiously proceed with their *experiments*.



It may be said, however, that the grape has been cultivated with some success in Vevay on the Ohio, and that in Virginia and Maryland it seems to be making some progress; but we should not forget that they have green peas on their tables, *six* weeks before *we* can produce them on *ours*, and we must pause, therefore, before we attempt to follow them in this experiment. We are too apt to forget that though we are one nation, and all our country is called *North America*, yet that we embrace every variety of climate, and that we must not consider the rules and practices of the Southern States applicable to our own favoured portion—favoured not by long seasons, and hot suns, and warm nights, but favoured by a climate, which keeps our fields green, our nerves and muscles strong and vigorous, and a soil, which, refusing profitable productions without great labour and skill, compels us to be industrious, and in the end, makes us as a people, richer and more powerful. It would be indeed a subject of great regret, if, disdaining the *real* blessings which we enjoy, we should strive to attain those which the goodness and wisdom of Providence has withheld from us. We should be very cautious as to the adoption of any measures, which should have a tendency to throw an air of *ridicule* upon experimental and scientific agriculture. The prejudices which we are obliged to encounter in introducing sound and judicious but *new* modes of culture are sufficiently strong, without exciting additional ones by a too hasty adoption or recommendation of *new* theories or *new* projects.

Those who may be disposed to admit the force and truth of the foregoing remarks, may be still inclined to ask whether we cannot naturalize, or (to use a Southern phrase,) *acclimate* with us, the grapes recently introduced from the Southern States, natives of America. There are several of these in Mr. Prince's catalogue of grapes. The answer I shall make is, that we have as yet no evidence, that these

native Southern grapes are capable of producing tolerable wine. There is no objection to the cultivation of them for the table. We have doubts, whether even these will stand the severity of our winters—we *know* that some of them *will not*, and even, if they should endure our frosts, we have no sound reason to believe that a grape which is sweet in latitude 35, will prove so when grown in latitude 42.

We have however more serious objections to the culture of the grape in our part of the country. It requires great skill as to its management, and much labour in the course of its growth. There are two modes of cultivation in Europe.

One, the Italian, in which trees are planted, over which the grapes are suffered to run at pleasure. This is suited only to very hot climates, and requires the extra expense of planting the trees to support the vines.

The other is the French or Swiss method, in which the vines are planted in rows and supported by stakes about five or six feet high, in which mode of culture the vineyards resemble at a distance, one of our fields of Indian corn.

The labour and expense of cutting and replacing these stakes to support the vines—the art and skill exercised in trimming the vines—occupy a great portion of the time of the labourers. This is done in a very considerable degree by females; and in countries in which the price of the labour of males does not exceed twenty-five or thirty cents per day, the price of female labour would be so low as to render this cultivation practicable.

But in *our* country we should hope the day to be far distant, in which we shall be compelled to condemn our females to *field* labour—to trim the suckers of the vine, and to carry the trimmings in baskets, on their *heads*, out of the vineyards. This would suppose an entire change in the moral character and habits of our people, which I should deem little adapted to our free institutions,

I deduce the following inference from this *statement*, (which is founded on my personal knowledge, and the evidence of my own senses,) that though the vine culture may succeed in those parts of our country which have the misfortune to be cultivated by slaves, it may not be adapted to our own section of the country in which, though many of us are *poor*, we are *all* free—in which, we can find *better* employment for our mothers and daughters, than to send them into the fields—in which, we consider that sex as our solace, and companions, as the instructors of our children, and are ready to forego the profits, which we may derive from their *personal* labours *abroad*. In short, our condition is too happy, and too independent to induce us to make such sacrifices of domestic comfort, even for a clear and decided addition to our income.

But these considerations do not include all which we might urge on this topic. We doubt the policy in attempting to coerce nature. Many of the countries which yield wine did so even in the patriarchal ages. If this portion of our country was in any degree similar to the wine bearing districts of Europe and Asia, in climate and soil, we should feel some encouragement in undertaking its culture. But it is *not* so. On the other hand, experience has shown that it is admirably adapted to the cultivation of the apple. In grape culture, you can have no herbage in your vineyards, and, indeed, no *other* plants will flourish under the grape, if cultivated in climates like our own. Greater labour and more skill are required in making good wine, than in any mode of agriculture we now pursue. Much *capital* is also necessary in making *proper cellars* for the ripening of the wine, and society in the countries in which it is made, is divided into a *few* rich and *many* poor. I must therefore express my humble opinion, that the grape was not made for *us*—and we ought to consider ourselves the favourites of Pomona, rather than of Bacchus—that we should be content.

ed with rich crops of hay—of mangel wurtzel —of potatoes and turnips—with fine flocks and herds—and be content to be tributary to *poorer* nations for the wine, which we consume.

These remarks apply only to New England.

JOHN LOWELL.

P. S. The best soil for a vineyard is a light porous but rich one—the best site a hill side with a southeastern or southern aspect: if there are natural terraces made by rocks, so much the better—the vineyards in Switzerland are planted on artificial terraces, and the vines of Madeira are raised on the steep sides of hills. The cuttings may be taken off at any time from December to February—but should be nearly covered with earth till they are planted, which should be as early as possible. Only one bud should be above the ground. Their success is very precarious in the open ground. They would be more certain of striking root if planted in shoal wooden boxes—say six inches deep, and the cuttings inserted so deep as actually to touch the bottom. This is suggested on the authority of Mr. Knight. The soil in the boxes should be rich but light, and be kept moist, but not wet—too little and too much moisture being equally fatal to grape cuttings. The boxes might be kept in a room that is light, or placed in a sheltered spot near the house. When the plants have taken root, one side of the box might be taken off and the plants carefully removed with all their fibrous roots. J. L.

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Boston, Jan. 12, 1825.

*John Lowell, Esq., President of the Massachusetts Agricultural Society.*

SIR.—In the remarks I heretofore offered, upon Orchard and Forest Trees, I proposed to place before your readers,

in an appendix, some observations on the age, and other circumstances in relation to them. Part of these may have a tendency to support a general theory as to their growth and duration. But most of them are of the nature of exceptions to general rules, and to be considered rather as "reminiscences," in which the curious may perhaps find some amusement, than as offering any instruction to the theorist.

Before I proceed to speak of the general or particular age of the orchard which I shall take first in order, I cannot but recur to the advantage of the mode of practice I have fallen into, where it was wished to have an orchard on a particular spot, on a light soil or plain, for local convenience, or domestic use. This mode minutely set forth, may be seen in No. I., Vol. VI.

It was, in effect, to lay aside and reserve the two upper strata, and remove about a foot of the gravelly or dead earth, and to replace that depth with small stones. The experiment has outdone expectation, and I have been induced this season to set out an orchard where it can be best availed of, near the house, and on a soil that under other circumstances, would not have been so appropriated.

I was much gratified to observe in an account given in a late English publication, of some trees which had apparently flourished, and attained great age, "that at the root, the earth was found paved with stones." The advantages promised in this mode of culture, are, 1st, The absorption and gradual distribution of moisture by the stones when most wanted; 2dly, The equalization of the temperature of the earth; and 3dly, The preventing the roots passing into the poorer under strata, by forcing them into a better soil, in a horizontal direction. These seem to be sources of encouragement in this mode of practice, at least deserving of a trial.

In considering the age and duration of the orchard, the apple and pear trees first present themselves. I have en-

deavoured to arrive with all the certainty which could be had at the period when several of these were set out in this neighbourhood. The first instance I shall notice, was about the year 1750, of apples and pears. These are principally decayed and removed; and for many years, those remaining have given little or no fruit. But the pear tree has proved the longest liver, and greatest fruit bearer. In a second, the orchard was set out in about 1760. This also is in a great state of decay, and most of the trees have failed, or very few only giving fruit. In this latter instance, the soil was very thin, and less favourable, and the trees much smaller. But the duration promised to be at least equal to the one preceding. It may be mentioned as the whim of an early cultivator. The gentleman who purchased this orchard, had it from the man who set it out, that "he put a peck of oats at the bottom of each tree."

The third orchard to be noticed was set out in about 1767. This is altogether of grafted fruit. Its most flourishing condition was in 1798, when it produced upon one and three-fourths acres over 160 barrels of fruit. The marks of decay have been visible in it for several years, though the trees are still somewhat productive.

It would seem, therefore, from these instances, that the apple tree acquires its greatest productiveness in a little over 30 years, and that its continued state of vigour and of decay, occupy about that period. Some, to be sure, remain mutilated and solemn memorials of former usefulness.

The mode of practice by some, of cutting off old limbs, to produce young wood and more fruit, wherever I have seen it practiced, has been of short lived utility.

Some which stand preeminent, as exceptions to all rules, are now to be mentioned.

In the fruit bearing season of 1822, I visited the garden of the Wyllis family in Hartford Connecticut, to see two extraordinary trees. The one an apple, said to have been

imported before the middle of the 17th century, by the old Secretary from England. The appearance of the tree was that of decay. It had been, probably, long hollow. At this time, as near as can be recollected, little more than one third of the circumference remained; of this the bark was sustained by a thin layer of wood. A few weak limbs at the top bore some dozens of apples. Of these I brought and exhibited at the anniversary dinner of the Massachusetts Agricultural Society, at Brighton, a sample. The fruit must be considered ordinary; its flavour was of a bitter sweet. It might have been useful for baking. What has made me look back to this incident more particularly, was, that about the same time, an English traveller was collecting a small box of the apples, which he took with him across the Atlantic, and presented to some Society, as I saw in a journal of that country; and the age and circumstances of this tree were noticed as quite extraordinary.

There is also a tree near where the Indian meeting house and burying ground in Natick were formerly, standing on an acre of ground given by an Indian to the Apostle Elliot, so called, which has been in bearing within a few years, and is said to have been a favourite apple with the Indians; it has obtained the name of the "Orange Sweeting." If this tradition is correct, this tree acquired nearly as many years; for this celebrated preacher, whose influence was so great amongst these tribes, died in 1690; and it was probably some years before, that he received this testimony of regard from his Indian admirer.

Of the size of the apple tree, 8 or 9 feet circumference occasionally occur.

As to product, I have also seen mention made of 50 bushels on a tree.

But both these points are so well exemplified in the county of Worcester, by a letter from W. STEDMAN, Esq. of Lan-

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caster, that I cannot do better than close this part of my subject by an extract therefrom.

“I have an ancient apple tree which bears every year a very large reddish and yellow skinned fruit, which is not in eating till the latter part of winter. It stands about 10 rods east of my barns. Its trunk near the ground, measures 12 feet 5 inches, and 4 feet above, 10 feet four inches, and is hollow from the ground upward, 8 feet, and would contain within it a 30 gallon cask—above, it is divided into three large branches; they are also hollow 2 or 3 feet from the trunk; they then become solid, and send forth numbers of thrifty and vigorous shoots which bear the fruit. Dr. Fisk, of Worcester, who visited me sometime since, who you know is a noted arborist, observed it was the largest apple tree he had ever seen.

“Of all trees for product, there is an apple tree on the farm of Thomas W. Ward, Esq. our Sheriff, in Shrewsbury, which is preeminent. It stands northeast from, and near to his barns, is large, and grows in a good soil—and he has often assured me, he has made several years ten barrels of cider from its fruit. The last year he made about eight barrels from it.”

The pear tree is sometimes intermixed with the apple in orchards, but oftener in gardens, or favoured spots of smaller extent. It is doubtless of longer life than the apple tree, and bears fruit for a greater extent of years. Many of very ancient date have been known in this city, particularly one in the garden of Major Melville. But I am enabled to give through the polite inquiry of the Hon. Mr. Silsbee, President of the Senate, the particulars of the celebrated Danvers tree of Gov. Endicott, in a letter from a descendant of that gentleman. It can hardly be expected to look further back.

*Salem, Dec. 4, 1823.*

HON. NATHANIEL SILSBEE,

DEAR SIR,

THE ancient pear tree in Danvers, about which you par-



ticularly inquired, was imported from England, and planted by Gov. Endicott on his Orchard farm in 1630. It stands on a hard clay bottom covered with a rich soil more than a foot deep, sheltered from the westerly winds, but exposed to the easterly. The ground has been cultivated as a field ever since it was planted, but no particular care has been taken of the tree until the last seven years, since which, for antiquity's sake, it has been kept enclosed, the ground dug and manured, new sprouts have made their appearance, and will no doubt live many years. It girts just above ground, 6 feet 8 inches, and tapers but little to the crotch, which is 4 feet 6 inches from the ground. It never was a tall tree; the top is now about 15 feet high, and is entirely hollow. It bore one and a half bushel of fair fruit this year, 1823, and always has been prolific. The fruit is good; and there can be no doubt of its having been engrafted.

Respectfully,

SAM'L. ENDICOTT.

I believe your readers will be too tired to venture into the woods with me, and the remarks on forest trees had better be deferred to another opportunity.

I am with Consideration and Respect,

Yours,

JOHN WELLES.

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## AGRICULTURAL INTELLIGENCE.

**U**NDER this head we had intended to take notice of any new suggestions, or improvements, benefactions, or new agricultural works; but we find that we shall not have room for them in the present Number. We shall, therefore, confine ourselves to the following brief sketch.

During the present year, Col. Thomas H. Perkins, of Boston, having ascertained that the most distinguished cultivators of Flax, the Irish, preferred the flax seed of Riga, imported a cask

of that seed, and presented it to the Society, which was distributed. We hope the gentlemen who received it will communicate the result of their experiments.

Admiral Coffin presented to the Society a Herefordshire Bull and Heifer, which are in the possession of John Prince, Esq. and at the same time a Heifer of the purest Short-horned breed, which, with the Bull, Admiral, of the same breed, presented by Admiral Coffin, last year, is in the possession of Ezekiel H. Derby, Esq. Salem.

Mr. Francis Peabody, of Salem, presented to the Society three Sheep, from the Province of Astrachan, Russia, which are deemed remarkable for their qualities for the table. The Hon. Col. T. H. Perkins also presented some of the improved long wooed sheep of the Netherlands.

In November last the Trustees of Dummer Academy, in the town of Byfield, intimated to the Massachusetts Agricultural Society their wish to establish an Agricultural School connected with an experimental farm, and tendered the patronage and care of it to the Trustees of the Massachusetts Society for promoting Agriculture.

The Trustees fully impressed with the importance of such an institution, appointed a Committee to examine the farm owned by the Trustees of Dummer Academy, and to confer with them on the best mode of carrying the plan into effect. The Committee reported that they thought the farm very well adapted to the purpose, that the Institution at Byfield offered great facilities for the execution of such an experiment, but that in their opinion it would be more desirable that its immediate management should be in the hands of the Trustees of Dummer Academy, and its supervision in such persons as the Legislature might think best; such, for example, as the Officers of the several Agricultural Societies in the State. The Trustees of the Massachusetts Agricultural Society have respectfully presented their views of the importance of such an institution, and their hope that it will meet with the approbation and be deemed worthy of the patronage and aid of the public. We most sincerely hope that the application will receive the attention and favour

which its high importance demands. It is, we are aware, new—it is an experiment.—So *have been*, at first, all the improvements, from the time when men were clothed in sheep skins, and subsisted on wild honey and acorns. It seems to us time, that those who cultivate the ground, should, now that they are restored to their rights and dignity in the State, receive their fair share of public patronage and favour.

Establishments for the advancement and perfection of their art, should be made, and all the advantages of education, which their occupation requires, should be extended to them. As they have few or no opulent men among them who can found schools and colleges for them, let the public, who never forget them when money is to be raised, or battles to be fought, not overlook them when they ask a fair share of public bounty in return. They constitute the strength, and will forever prove the safeguard of the State.

Thomas Andrew Knight, Esq. President of the London Horticultural Society, known in this country as well as Europe, for his enlightened views, his unremitted and successful exertions in the cause of natural science, and his devotion of a noble fortune to the promotion of these great ends, has this autumn renewed his offer of sending to this country specimens of new and improved varieties of fruits. Those which he intended to send the last Spring, were not sent, owing to the miscarriage of letters addressed to him in answer to his proposal. He now says that he shall continue every year or two to forward a box of such fruit trees as he may deem valuable to us. Such disinterested and philanthropic feelings cannot but receive the approbation and gratitude of our citizens, which will be increased by the knowledge, that from the commencement of our struggle against the ministry of Great Britain, he has been the constant and warm friend of the United States, and has taken a deep interest in its prosperity.

## CIDER.

The following remarks have been sent to us by a friend to whom they were addressed with an injunction not to use the name of the writer. They are plain and practical, and although much has been written on the subject, yet we have not generally (we mean our farmers) adopted any of the valuable hints which we have repeatedly given on the subject. The Christian Society at Canterbury, New Hampshire, have been able to prepare their cider, and send it sixty miles to the Boston market, where it has brought the price of ten dollars per barrel. Could not our farmers nearer to this great market prepare their cider equally well, and send it for sale in a perfect state? Could they not also thus prepare it for their own consumption? If they could do so by adopting the following simple plan, would they not do more to check the inordinate use of spirituous liquors than by any other means? Are they not aware that the farmers of New Jersey, with no greater advantages than *they* possess, do prepare their cider in such a manner, as that it is sent to the West India and other foreign markets, and that it supplies our own navigators with a wholesome and pleasant beverage? The hint as to the drawing off the casks by a tin syphon, which is explained in the following extract, appears to us valuable. We would simply add, that three years trial has satisfied us, that by the simple process of passing or running the cider through sand, pure sand, (where it can be had,) so far purifies the cider, that the fermentation is never afterwards too violent, and that no further drawing off is needful. Let both plans be fairly tried—they cost no money, and very little labour.—EDITORS.

*Hallowel, Nov. 25, 1824.*

To ———, Boston.

MY DEAR SIR,

ON the 14th of June I took up my pen to write to you on the subject of cider, and was interrupted; but I hope that it is not too late in some respects, even for the present season, to resume the object I had in view.

The process as to managing our cider, to which you have referred, is very simple; but since the 21st of last month one of your Agricultural Committees, at Brighton, reported, that “no cider sufficiently good to be entitled to the first premium for this article, had been exhibited;” and since some cider is said to have been sold in Boston, last season, at \$10 per barrel, (apparently because little that was good presented itself,) the following statement may still be acceptable.

In the *first* place, the early making of the liquor was taught

to me many years ago by *yourself*; and the benefit of it has been farther ascertained by the testimony of others, (as the late Mr. William Coxe, of New Jersey,\*) and likewise by my own experience. When the first fermentation of cider has advanced sufficiently to have cracks formed in the scum at its top, (or a short time afterwards,) a tin *syphon* is applied to draw off the liquor into a *second* cask; by which means a quantity of scum and sediment is left behind, and the cider is partially purified; at the same time, that excessive fermentation, (as will hereafter be noticed,) is prevented. If the *legs of the syphon* be fastened into the bung holes of the two casks, by means of pieces of a *hollow cylinder* of soft wood or of cork, cut conically on the outside, and split into several parts *longitudinally*, adding rags or clay at each bung hole, to close it up more completely; time and trouble will be saved; and the escape of ardent spirit and fixed air be lessened, as well as the communication with the outward air. By this simple method, a large number of casks are easily racked off in succession; care only being taken to keep the rags, clay, and syphon, sweet. Nor does the above operation require the aid of more than one or two *empty* barrels, in addition to the casks containing the cider; for each cider cask, as fast as it is emptied, is to be immediately scalded, that it may take its turn in receiving the purified cider.

*Secondly.* At the time of bottling the cider, (say with us in April, or perhaps a little later,) the racking by the syphon is repeated. The benefits are as follows:—There is a fresh removal of scum and sediment. which farther brightens the cider, (so that no freezing, at least with us, is needed;) nothing is bottled which is useless; no brandy is employed, and yet few bottles burst or corks fly; the liquor suffers little by shaking in the bottle, or at its pouring out; and remnants of the bottle will commonly be good on the second day, for the benefit of small householders.

*Thirdly.* A second racking with the syphon is proper, even for liquor *drank out of the cask*; for as rum and sediment ought

\* See his book published in 1817, on the Cultivation of Fruit Trees, and the Management of Orchards and Cider, &c. &c. pp. 66, 67.

never to be drank, the sooner the remains of these are removed the better; particularly as these articles seem to act as a ferment, and hasten the decomposition of the cider. Accordingly, it is a matter of fact, that cider, when double racked, will keep longer in the cask, than when single racked; and it is also true, that it will be longer good *upon draught*, as a consequence of its keeping longer good in the cask. Its keeping well on the draft will be still more certain, if the vent peg be sparingly used; or if the vent hole be shut either by a weight or a spring, instead of a peg, where there is carelessness in the drawing.

*Fourthly.* Unless the cider be free from sediment, it ought never to be *moved* without racking; for, if the good and bad parts of the cider be brought a second time into contact, they may form a new union, and call for a new separation, which it may not always be easy to procure.

*Fifthly.* Our bottled cider is packed in binns, in sand; the sand being moistened, and the bottles placed upright. The bottles are thus strengthened; the corks are kept swollen; the sediment falls to the bottom; and the effect of sudden changes of temperature, which might produce internal motions in the cider, is prevented. Moreover, I may add on the subject of bottling, that our practice is to keep the bottles open for a day or two before they are corked; and it is perhaps useful to leave a little room, (clear of liquor,) below the cork, that the fixed air, or carbonic acid gas, escaping from the liquor, may have a space where it can remain safely by means of a little compression, either to reunite in time with the liquor, or prevent the cider having needless intercourse with *common* air.

*Sixthly.* The cider in every case is to be kept in a cool and dark cellar, free from currents of air; for the sun's light, even when coming from reflected rays, has some little warmth in it; and air operates more speedily on the temperature of bodies when moving in a current.

*Lastly.* Fresh barrels for each years' cider are unnecessary, since old barrels are free from the taste of new wood; and, with good hoops, will serve during several seasons. But in this case, the casks when first emptied, ought to be rinsed with boiling

water, and then drained ; then to have their hoops slightly loosened, and the bungs restored, but not too closely ; and afterwards to be kept where the air is sweet and dry. When wanted again in the fall, they must pass under the cooper's eye, and have a new scalding with lime water.

A few remarks will now follow in addition to the above statement.

*First.* If the lees of the cider act as a ferment, (which I presume will be admitted,) then, when the cider tends to excessive fermentation, the *natural* cure is to give it an additional racking ; which seems to agree with experience. Brandy applied with this view is so far from being always successful, that Mr. Thomas Andrew Knight thinks, that it has at times even appeared to increase the evil ; and others have conceived the same. Brandy may tend to *preserve* cider, (as it does wine,) when it has undergone a certain amount of fermentation ; but it is doubtful how far it is to be opposed to fermentation in the *first instance*. Currant wine improves when poured upon the *lees* of Madeira wine ; and other wines are commonly thought to improve for a time upon their *own* lees ; but as fermentation has its stages, and lees also may have *their* stages ; it is better for us to confine ourselves with precision in the present instance to the facts we know. The difference in the management of common cider and Virginia crab cider, spoken of by Mr. Coxe, confirms this caution.

*Secondly.* As to the *lees* of common cider, Mr. Coxe makes a singular assertion, at p. 68, namely, " that the *lees* of the cider may be put into small [triangular] bags, (such as are used for jellies,) to filtrate ; and the liquor from them will become bright. [This] may then be returned to the cask ; in which it will have the effect of PREVENTING a second fermentation. It seems (he says) to undergo a considerable change in the progress of filtration ; its colour becomes deep ; its taste, harsh and flat ; and it has a strong tendency to become acetous." But he adds, that " should it, from any cause, become acetous or sour, in that case, it must not on any account be put into the cask." Of this practice I have myself no experience, though I hope to know some-

thing more about it by means of a trial. In the mean time, I would ask, whether this *filtered* liquor does not contain a large proportion of the juices of the skin, seeds, core, and stalk of the fruit, which may assist in preserving the juice of the pulp?\*

*Thirdly.* Our own cider, which you have commended for its resemblance to champagne, when first made, is sufficiently rich to the taste; and yet in general becomes *light*, when it has been treated as above mentioned, (whether it be prepared for drinking from the cask, or for bottling.) On what this depends, will best be discovered, when the method I employ is tried with other ciders. At present, I incline to attribute the fact with us, chiefly to our apples and to our soil; without affirming however that the treatment we use may not have its share therein. I must further observe, however, that our cider usually remains a long time quiet, before fermentation commences. But I do not design to change my own proceedings, unless for a sufficient reason; because our cider in its present form belongs to a class by itself, which is preferred by many, and keeps well for our own purposes and rate of consumption. It has also an enlivening, though less intoxicating power, than most other ciders; so that when taken in moderation, even ladies need not fear its effects.

*Fourthly, and lastly.* Some individuals have kept a cask of cider throughout the year, for their own private drinking, using at the rate of a tumbler daily, without racking, fining, or

\* Chaptal, speaking of making wine, says, "When the fermentation is quieted, and the mass of liquor is in a state of absolute repose, *the wine is made*; but it is *clarification* gives it new qualities, and preserves it from the danger of turning.

"This clarification is spontaneous, being the mere result of time and rest. Gradually, there is a deposit at the bottom, and on the sides of the cask; which clears the wine from every thing which is not in a state of perfect solution; or of every thing which is in excess. It is this deposit which is called lees (*lie, sève*;) a confused mixture of tartar, of principles very analagous to fibrine, and of the coloring matter." Vol. I. p. 132. Paris edition of 1801.

Chaptal may be consulted as to the effect of the stalks, skins, and lea of the grape upon wine; which he makes various according to the case. The taste from the stalk as sharp and austere, (*âpre* and austere.) See some of the 1<sup>st</sup> chapters of his second volume.



bottling; and also without using the vent-peg. Here rest and the gradual diminution of the liquor, with the constant increase and confinement of the air which daily escapes from the liquor, accomplish every thing wanted to the content of the parties.

P. S. In order to save bottles, may not the following expedient be tried? Let the cider most suitable for bottling be selected, and at the time when the bottling is proposed, let one, (or a part of one barrel) be drawn off into *kegs*; and thence, as wanted, into bottles; the rest being put into bottles from the first. One set of bottles will thus serve in succession for several kegs; but every keg, as soon as opened, should be bottled. The cider thus bottled, will at least serve for the *early* part of the season for bottled cider; and if it should be inferior to the best bottled cider, it may, nevertheless, serve as bottled cider for common purposes.

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CATTLE SHOW, EXHIBITION OF MANUFACTURES, PLOUGHING MATCH, AND PUBLIC SALE OF ANIMALS AND MANUFACTURES, AT BRIGHTON, MASS.—On WEDNESDAY and THURSDAY, the 19th and 20th of October, 1825.—To commence at Nine o'clock A. M. on the first day, and at Ten o'clock on the second day.

**THE** Trustess of the Massachusetts Society for the Promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c. at Brighton, on Wednesday and Thursday, the 19th and 20th of October, 1825; and they offer the following Premiums:—

FOR STOCK.

For the best Bull, raised in Massachusetts, above one	
year old,	\$30
For the next best, do. do.	20

For the next best, do. do.	-	-	-	-	-	\$10
For the best Bull Calf, from five to twelve months old,						15
For the next best, do do	-	-	-	-	-	10
For the next best, do do	-	-	-	-	-	5
For the best Cow, not less than three years old,	-	-				30
For the next best, do do	-	-	-	-	-	20
For the next best, do do	-	-	-	-	-	15
For the best Heifer, (having had a calf,)	-	-				15
For the next best, do do	-	-	-	-	-	10
For the best Heifer (not having had a calf,)	-	-				12
For the next best, do do	-	-	-	-	-	10
For the next best, do do	-	-	-	-	-	8
For the next best do do	-	-	-	-	-	6
For the best Ox, fitted for slaughter, regard to be had to, and a particular statement to be given of, the mode and expense of fattening,	-	-	-	-	-	25
For the next best, do do	-	-	-	-	-	20
For the next best, do do	-	-	-	-	-	10
For the best pair of Working Oxen,	-	-	-			25
For the next best, do do	-	-	-	-	-	20
For the next best, do do	-	-	-	-	-	15
For the next best, do do	-	-	-	-	-	12
For the next best, do do	-	-	-	-	-	8
For the best Merino Ram,	-	-	-	-	-	15
For the next best, do	-	-	-	-	-	10
For the best Merino Ewes, not less than five in number,						20
For the next best, do do do	-	-	-	-	-	10
For the best Boar, not exceeding two years old,	-	-				12
For the next best, do do	-	-	-	-	-	8
For the next best, do do	-	-	-	-	-	5
For the best Sow,	-	-	-	-	-	12
For the next best, do	-	-	-	-	-	8
For the next best, do	-	-	-	-	-	5
For the best Pigs, not less than two in number, nor less than four months old, nor more than eight,	-	-				10

For the next best, do do - - - - - \$5

None of the above animals will be entitled to premiums, unless they are *wholly bred* in the State of Massachusetts.

Any of the above Stock, when raised and still owned at the time of the exhibition by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

For the best Ram which shall be imported into this State, after this advertisement, and before the 19th day of October next, of the improved Leicester breed of long woolled sheep, - - - - - \$75  
or a gold medal of that value, at the option of the importer.

For the next best, do do - - - - - 50

For the best Ewe, of the same breed, imported under the same terms, and for the like superior qualities, 60

For the next best, do do - - - - - 40

The persons claiming these premiums to engage to keep the imported animals within the State.

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future premium of the Society, except it be for an entirely distinct premium, and for qualities different from those for which the former premium was awarded.—*An animal which shall have obtained a premium as a Milch Heifer shall not afterwards be entered for premium as a Milch Cow.*

#### FOR GRAIN AND VEGETABLE CROPS.

To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than one hundred bushels, - - - - - \$20

To the person who shall raise the greatest quantity of Vegetables, grain, peas and beans excepted, for winter consumption, of the stock on his own farm, and not for sale, in proportion to the size of the farm and

stock kept, having regard to the respective value of said vegetables as food, stating the expense of raising the same, and the best mode of preserving the same through the winter, - - - - -	\$30
To the person who shall raise the greatest quantity of Winter Wheat on an acre, not less than thirty bushels, -	20
To the person who shall raise the greatest quantity of Spring Wheat on an acre, not less than thirty bushels, -	20
To the person who shall raise the greatest quantity of Barley on an acre, not less than forty-five bushels, -	20
To the person who shall raise the greatest quantity of Rye on an acre, not less than thirty bushels, -	20
To the person who shall raise the greatest crop of Millet on an acre, cut and cured for hay, not less than three tons, the claimant giving evidence of the time of sowing, the quantity of seed sown, and the quantity of hay produced, - - - - -	20
To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels, -	20
To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels, -	20
To the person who shall raise the greatest quantity of Common Beets on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Sugar Beets on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels, -	20
To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of	

turnips on an acre, not less than six hundred bushels,	\$20
To the person who shall raise the greatest quantity of	
Onions on an acre, not less than six hundred bushels,	20
To the person who shall raise the greatest quantity of	
Cabbages on an acre, not less than twenty-five tons	
weight, free from earth when weighed, - - -	20
To the person who shall raise the greatest quantity of	
dry Peas on an acre, not less than thirty bushels,	20
To the person who shall raise the greatest quantity of	
dry Beans on an acre, not less than thirty bushels,	20
To the person who shall give proof of having produced	
the largest quantity of dressed Flax, raised on half	
an acre, and not less than two hundred and fifty	
pounds, - - - - -	20

To entitle himself to either of the Premiums for Grain or Vegetable crops, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium, and must state, in writing, under oath of himself, and one other person, (accompanied by a certificate of the measurement of the land by some sworn surveyor,) the following particulars :

1. The state and quality of the land, in the spring of 1825.

2. The product and general state of cultivation and quantity of manure employed on it the year preceding.

3. The quantity of manure used the present season.

4. The quantity of seed used, and if Potatoes, the sort.

5. The time and manner of sowing, weeding, and harvesting the crop, and the amount of the product, ascertained by actual measurement, after the whole produce for which a premium is claimed, is harvested, and the entire expense of cultivation.

6. In regard to Indian Corn, the entire crop of the acre offered for premium, if shelled, must be measured between the 15th November and 1st December. If not shelled, the whole must be weighed within the same dates, and the Trus-

tees have determined to consider *seventy-five pounds* of *corn and cob* as equivalent to one bushel of shelled corn.

And in relation to all vegetables (except Potatoes, Onions, and common turnips,) at least *forty* bushels must be weighed, and *fifty-six pounds* will be considered as equal to one bushel, free from dirt.

#### AGRICULTURAL EXPERIMENTS.

- To the person who shall give satisfactory evidence on,  
 "Soiling Cattle," not less than six in number, and  
 through the whole season, together with a particular  
 account of the food given, and how cultivated, - \$30
- To the person who shall make the experiment of turn-  
 ing in green crops as a manure, on a tract not less  
 than one acre, and prove its utility, and cheapness,  
 giving a particular account of the process and its  
 result, - - - - - 20
- To the person who shall, by actual experiment, prove  
 the best season and modes of laying down lands to  
 grass, whether spring, summer, or fall seeding be pre-  
 ferable, and with or without grain on different soils, 30
- To the person who shall prove to the satisfaction of the  
 Trustees, that his mode of rearing, feeding and fatten-  
 ing neat cattle is best, - - - - - 20
- To the person who shall prove to the satisfaction of the  
 Trustees, the utility and comparative value of the  
 cobs of Indian corn, when used with or without the  
 grain itself, ground or broken, - - - - - 20

The claim under the two last heads, together with the evidences of the actual product, must be delivered, free of expense, to Benjamin Guild, Esq. in Boston, Assistant Recording Secretary of this Society, on or before the first day of December next—the Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

BUTTER, CHEESE, HONEY, CIDER, CURRANT WINE.

To the person who shall take up in the season, on his own farm, the greatest quantity of good honey, and shall at the same time exhibit superior skill in the management of Bees. [If there be any thing supposed to be new in the management the same to be communicated in writing,] - - - - - \$10

For the best Cheese, *not less* than one year old, and not less in quantity than one hundred pounds, - - - 10

For the next best, do do - - - - - 5

For the next best Cheese *less* than one year old, - 10

For the next best, do do - - - - - 5

For the best Butter, not less than fifty pounds, - - 15

For the next best, do do - - - - - 10

For the next best, do do - - - - - 7

For the next best, do do - - - - - 5

For the greatest quantity of Butter and Cheese, made between the 15th of May, and the 1st of October, from not less than four cows, the quantity of Butter and Cheese, and the number of cows to be taken into consideration, and specimens to be exhibited at the Show, of not less than twenty pounds of each, and the mode of feeding, if any thing besides pasture was used, - - - - - 20

For the best specimen of Cider, not less than one barrel, made in 1824, manufactured by the person who shall exhibit the same, and from apples grown on his own farm, - - - - - 15

For the second best barrel, - - - - - 10

The person obtaining the first premium shall be entitled to a further sum of \$5, as a compensation for the premium barrel of cider, which shall be retained and used at the Show Dinner, in order that he may have the credit of it.

[These premiums will be continued in future years. Persons claiming them must state, in writing, their process of

making and managing their cider, and the kind of apples used.]

For the best specimen of Currant Wine, not less than one gallon, exhibited by any person who shall have made not less than 30 gallons, in the same season in which that which shall be exhibited was made, (a statement to be given, in writing, of the process of making the same,) - - - - - \$10  
 For the next best, do do - - - - - 5

#### FOR INVENTIONS.

To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - - - 20

To the person who shall invent the best Machine for pulverising and grinding Plaster to the fineness of twenty-five bushels per ton, and which shall require no more power than a pair of oxen or horse, to turn out two tons per day, and so portable that it can be moved from one farm to another without inconvenience, - - - - - 30

To the person who shall produce, at the Show, any other Agricultural Implement, of his own invention, which shall in the opinion of the Trustees, deserve a reward, a premium not exceeding *Twenty Dollars*, according to the value of the article exhibited.

In all cases proofs must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer. Persons who have taken out patents for their inventions, are not thereby excluded from claiming any of the above premiums.

No claimant will be entitled to a premium unless in the opinion of the Committee, the machine or implement presented by him shall be superior to any designed for the same use, which shall have heretofore gained a premium.



## FOR FOREST TREES, FRUIT TREES, AND HEDGES.

- For the best plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the first of September, 1827, - - - - - \$100
- For the best plantations of White Ash, Larch, and Locust Trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state on the first of September, 1827, - - - 50
- For the best Live Hedge, made either of White or Cockspur Thorn, planted in 1820, not less than one hundred rods, and which shall be in the best thriving state in 1827, - - - - - 50
- For the best Buckthorn Hedge, not less than one hundred rods, and which shall be in the best thriving state in 1828, - - - - - 50
- To the person who shall have planted out on his farm, since the spring of 1816, the greatest number of Apple Trees, not less than one hundred in number, and who shall exhibit to the Trustees, at the Show in 1827, satisfactory evidence of his having managed them with care and skill, - - - - - 50

## FOR DOMESTIC MANUFACTURES.

- To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8 yards wide, exclusive of the list, forty yards in quantity, and dyed in the wool, - - - - - \$20
- For the second best, do do do - - - - - 15
- For the best superfine Cassimere, not less than 3-4 yard wide, or less than forty yards in quantity, - - - 12
- For the second best, do do do - - - - - 8
- For the best superfine Sattinet, 3-4 yard wide, not less than fifty yards, - - - - - 8
- For the second best, do - - - - - 5

## FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than twenty yards in quantity, - - - - -	\$12
For the second best, do do - - - - -	8
For the best double milled Kersey, 3-4 yard wide, not less than twenty yards in quantity, - - - - -	12
For the second best, do do - - - - -	8
For the best Coating, 3-4 yard wide, not less than twenty yards in quantity, - - - - -	8
For the second best, do do - - - - -	6
For the best Flannel, 7-8 yard wide, not less than forty-five yards in quantity, - - - - -	10
For the second best, do do - - - - -	7
For the best yard wide Carpeting, not less than thirty yards in quantity, - - - - -	15
For the second best, do do - - - - -	7
For the best 5-8 yard wide Stair Carpeting, not less than thirty yards in quantity, - - - - -	10
For the second best, do do - - - - -	7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long, - - - - -	6
For the second best, do do - - - - -	4
For the best Woollen Knit Hose, not less than 12 pair in number, - - - - -	5
For the second best, do do - - - - -	3
For the best Worsted Hose, not less than 12 pair in number, - - - - -	5
For the second best, do do - - - - -	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number, - - - - -	4
For the second best, do do - - - - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number, - - - - -	5
For the second best, do do - - - - -	3
For the best Linen Diaper, 5-8 yard wide, not less than 30 yards in quantity, - - - - -	3

For the second best, do do - - - - -	3
For the best yard wide Diaper, (for table linen) not less than 10 yards in quantity, - - - - -	10
For the second best, do do - - - - -	5
For the best specimen of Sewing Silk, raised and spun in this State, of good fast colours, not less than one pound, - - - - -	5
For the second best, do do - - - - -	3
For the best Linen Cloth, (for shirting or sheeting) one yard wide and twenty-five yards long, - - - - -	8
For the second best, do do - - - - -	4
To the person who shall produce the best specimen of any Cotton fabrics in private families, not less than five pieces, - - - - -	20

All of the above manufactures of which the material is either in whole or in part sheep's wool, must be made of wool of the growth of the United States, and manufactured within the State of Massachusetts. And all Manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed, so as not to be seen, or known by the Committee, nor must the Proprietors be present when they are examined ; in default of either of these requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, or manufactured Articles, may be offered for premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever, merely from a want of competition, any of the claimants may be considered entitled to the premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom premiums shall be awarded, may, at their option, have an article of Plate with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered, the Trustees may, having regard to the circumstances of the competitor, award either one of the Society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the Society's premiums shall be discovered to have used any disingenuous measures, by which the objects of the Society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but be rendered incapable of being ever after a competitor for any of the Society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

#### PLOUGHING MATCH.

On the second day of the Cattle Show, viz. the 20th day of October, Premiums will be given to the owners and ploughmen of three Ploughs, drawn by two yoke of oxen, and to the owners and ploughmen of three ploughs drawn by one yoke of oxen, which shall be adjudged by a competent Committee, to have performed the *best work, with least expense of labour*, not exceeding half an acre to each plough. Notice will be given in the public Papers, at least six weeks before said day, that a piece of ground has been provided for twenty ploughs—ten double and ten single teams; and that entries may be made of the names of the competitors until the morning of the 20th. Preference will be given to those who enter first; but if, on calling the list at the hour appointed, precisely, those first named do not appear, the next in order will be preferred. There will be two Committees of three persons each—one to be the judges of the ploughing by double teams, the other of the ploughing by single teams—the latter to have assigned to them a part of the field distinct from that of the double team.

Premiums as follows, (being the same for the double and single teams.)

First Plough	\$15	Second Plough	\$10	Third Plough	\$6
Ploughman	8	Ploughman	5	Ploughman	3
Driver	4	Driver	3	Driver	2

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons intending to contend for these Prizes, must give notice in writing, to GORHAM PARSONS, Esq. of *Brighton*. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the committee on the subject. The ploughs to be ready to start at 10 o'clock, A. M.

The result of the last Ploughing matches at Brighton, and the satisfaction expressed by so many of their agricultural brethren, will induce the Society to continue these premiums annually, in connexion with the Cattle Show, as an efficacious means of exciting emulation and improvement in the use and construction of the *most important instrument of agriculture*.

*The trial of Working Oxen is to take place on the first day at 11 o'clock, and no animals less than four years old will be allowed to enter as working cattle.*

Persons intending to offer any species of Stock for premiums, are requested to give notice thereof, either by letter (post paid) stating the articles, or to make personal application to the Secretary of the Show,\* *Brighton*, on or before the 18th day of October, in order that he may enter such notice or application, so that tickets may be ready at 9 o'clock on the 19th. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

All articles of manufactures and inventions, must be en-

\* Jonathan Winship, Esq.

tered and deposited in the Society's Rooms, on Monday, the 17th of October, and will be examined by the Committees on Tuesday, the 18th, the day before the Cattle Show; and no person but the Trustees shall be admitted to examine them before the Show. The articles so exhibited, must be left till after the Show, for the satisfaction of the public.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of stock, will take place on the 19th, and Ploughing Match on the 20th of October.

The Trustees also propose to appropriate, *on the first day of the Cattle Show*, their Pens for the public sale of any Animals, that may have been offered for premium, and also of any others that are considered by them as possessing fine qualities. Notice to be given hereafter of the time of public sale of Manufactures. Sale to commence at 12 o'clock precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before 10 o'clock of the 10th. Auctioneers will be provided by the Trustees.

By order of the Trustees,

R. SULLIVAN,	}	<i>Committee.</i>
J. PRINCE,		
G. PARSONS,		
E. H. DERBY,		

*January, 1825.*

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MASSACHUSETTS

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ON THE IMPROVEMENT OF OUR BREED OF HORNED CATTLE  
BY IMPORTATION.

**W**E are induced to say something on this subject, not only because we think it an important one, but because some very able and interesting remarks have been made upon it by the venerable President of the Essex Agricultural Society.

In the course of his remarks and quotations, he has been pleased to refer to the editors of this journal, or at least to one of them, and he has cited passages, which might lead readers to infer that we entertain the opinion, that little benefit will be derived from importing the improved races of Great Britain (at least such might be the inference drawn from them). It is probable, also, that most persons who may read the essays of Col. Pickering, will believe that he is of opinion, that these importations of foreign stock are of little importance, and of course, that the attempt to cross the imported animals with our own stock, is nearly useless labour and expense.

Such is the general effect of the remarks, and such we think will be the impression, and as his weight of character and great opportunities both of reading the most approved books on this topic, and of seeing various descrip-

tions of cattle in all parts of the United States, justly entitle him to a great share of public confidence, we think it a duty we owe to the public to state our own views upon the subject. We are not opposed to what we believe to be Col. Pickering's opinions. We coincide with him in the greater part of them, but we think the tendency of his essays is to discourage the attempt to improve our own breeds by foreign crosses, and this *tendency* we regret, and shall give our reasons for regretting it.

We begin then by saying, that we presume our ancestors very early ceased the importation of cattle from England. The ships were small, crowded with passengers and their effects; the passages long, the transport expensive, and we assume it as probable, that few cattle, if any, were imported after 1650.

It is well known, that the agriculture of England was then in a low state compared with its present condition. Successions of crops were nearly unknown; root crops for winter fodder were, we believe, entirely so. The prices of cattle were small, no great encouragement had been given to improve the breed. It is probable, therefore, that the cattle imported were not of a very improved race.

On the other hand, there can be no doubt, that our climate and pastures are well adapted to the preservation of cattle in as good a state as when imported, and rather to improve them. This we infer from the *fact*, that they are so fine, rather than from any general reasoning derived from our climate and soil, and still less from our treatment of them. If we regarded those only, we should say, that the heat of our summers, and length and severity of our winters, were unfavourable to an animal impatient of great heat and severe cold, and thriving much better on green succulent food than on dry meadow hay. In a short excursion made this spring into the country, we found the cows turned out to very short pastures, (on the 18th of May) thin, feeble and



in every respect miserable. We speak of the great mass of them : and we understand the common practice to be, to feed the cows on meadow hay, reserving the more substantial food for their working cattle and horses.

Now it does not seem to us possible, that we can have materially improved our horned cattle since we imported them ; that we have preserved them so perfect as they are in Vermont, in Hampshire and Worcester counties of Massachusetts, is rather a matter of some surprise, proving we think clearly, that a little more care in providing against the cold of winter, and its impoverishing diet, would enable us to surpass Great Britain in this important article of husbandry.

As the agriculture of Great Britain has gone on daily and regularly in an improving course, ever since the middle of the seventeenth century, and more especially since the middle of the last century, while our's has continued stationary or even retrograde, till within the last 50 years, it would naturally be expected that their race of horned cattle would gradually improve, and more especially since their opulent farmers have devoted their attention to their improvement. The spirit of rivalry, the great prices paid for more than 50 years for fine bulls and cows must have had this effect.

Let us take an example which is more easily examined, because it is much more obvious, their races of sheep. Surely it will not be questioned, that the Dishley or New Leicester race of sheep, are far superior to any which we raise, (the merino an imported race alone excepted, on account of its fine fleece). We have no good race of native sheep, and we have no sheep to compare with those of Great Britain. Why is this so ? Possibly because the perpetual verdure of England is more favourable to the propagation of sheep ; but we think that it is principally owing to neglect on our part.

The same thing is true with respect to swine. The Bed-

ford, a spotted race, first introduced into Massachusetts by Col. Pickering, is far superior to any one which we before possessed. Since the introduction of these, there have been other breeds introduced, which, so far as we can judge by description and by prints, are the race called in England the Berkshire, or perhaps crossed with the Chinese, which for aptitude for fattening, and for profit, are far superior to our old, long-legged race, who consumed the farmer as well as the fruits of his industry.

We believe, and we believe because we have seen, that the horned cattle of Great Britain are as a whole body, superior to our own. If Col. Pickering should pass a six week's tour in England, he would feel as we do, that it is not a question to be discussed, but a point settled. Twenty-two years since we spent a twelve-month in that country. We shall say nothing of the shows of cattle at the Smithfield club celebration, nothing of the Lewes show of cattle. We admit, that when Dukes, and Marquises, with incomes of 500,000 dollars, are patrons and competitors, animals may be produced of *any* form, and of *any* reasonable dimensions. Money and care will put flesh in any quantity, and in the most profitable parts of any animal of good form. We shall therefore omit any reference to their cattle shows as compared with our own. Any picture of them (however true in itself) would appear to be as exaggerated, as an attempt to give an idea of the confluence of passengers, and the extent and vastness of London would be to an inhabitant of the thriving town of Worcester. It is not a thing to be described. It can only be half understood by seeing it, for the mind is so bewildered and lost, that it loses at least half its powers of perception.

We say nothing, therefore, of the professed exhibitions of rare animals, but this we do say, that when we travel through England, we find ourselves among a race of improved horned cattle, nearly every one of which we *covet*. Let Mr. Marshall or Mr. Young (old writers) say what they

will, nothing can destroy the effect of ocular demonstration. The cattle of England are far superior to our own, as a body, and it is not precisely correct to compare individual exceptions in our country with general and average statements of whole counties in England. We are sorry to say further, that the cattle of the low countries and of Normandy, appeared to us much finer than our own, in a visit made to these counties eight years since. They were in better condition, and much fewer miserable individuals among them. They had learned the important lesson, that a poor animal is not worthy of its support. We have always thought with Col. Pickering, that our country possesses at this moment, a race of cows, and possibly of bulls, which selected with care, their progeny raised, and kept from contamination with inferior animals, for five or six generations, would produce a race of cattle which we might shew with pride at Smithfield. But who are our capitalists that will select and take due care of them? Where is the man who has so cautiously guarded the progeny of a fine cow? and if he did, unless he should raise her bull calves as husbands, how can he hope to keep the race pure?

Would there be any question in the mind of any sensible cultivator about to raise his own stock, that if a neighbour had improved his own race so that they were eminently fitted for the various uses of this most important agricultural animal for milk, for beef, and for draught, that it would be for his interest to procure that stock, and to sell off his own miserable breed? We trust not. Well, then, another nation has done this for us. She offers you the effect of 50 years experiment. Will you refuse it? We hope not.

The Massachusetts Agricultural Society offered a premium for the importation of the best races of Great Britain. They came. The premiums were awarded. The public admired the animals. The public may have been deceiv-

ed: they may have been carried away by the novelty. Still they lingered, and looked, and crowded round these imported animals. They thought that they were superior to any of their own. Experienced farmers, herdsman, butchers, so pronounced them; they awarded the premiums. Still this may all be infatuation, the mere love of novelty. They produced calves: the calves were better formed, grew faster, had flesh on more valuable parts, had better hair, and "*finer feel*," indicating a disposition to fatten; they weighed more on the same keeping. Was all this illusion? We think not. We say we *think* not; we add, we know it is not *all illusion*. We know it to be founded on good and substantial grounds. We had some excellent cows of native race which we had carefully kept through three successive generations, and we have been amply rewarded for it. We have recently crossed them with the foreign breeds; the calves were manifestly superior. Not having a large farm, we parted with the calves to our friends, and recently upon inquiry of a friend who had two of our calves, and had a stock of eleven cows, we found the two highest as to milkers, were of this mixed race.

We have now two cows of the mixed race, one out of Fill Pail, and one out of Mr. Parsons' Holderness, and they are much superior to any cows we have been able to purchase for 20 years. We are now raising calves of the half blood to supply the cows which are now getting aged. One advantage they certainly have; they keep their flesh better without diminishing their milk. Still there are native cows, a very few, as good, and some better.

We now proceed to the most important consideration in relation to these imported animals.

Their calves sell better; they are more carefully watched; they have introduced a habit of attention to stock; they excite a spirit of rivalry, and one of the most valuable and important effects of the late interesting letters of Col.

Pickering will probably be to induce our farmers to endeavour to compete with and surpass the imported breeds.

While Col. Jaques, the most successful and the most intelligent of our breeders, who under great disadvantages of location, seems to rival the celebrated Bakewell in his skill and attention can sell his pure breed, as he has done this spring at 300 dollars for an eight month's bull calf, there can be no doubt that the experiment will be fairly tried. As Col. Pickering does not seem to believe that any serious evil has resulted from the importation of a *worse stock*, we think we may safely encourage the crosses of this race with our own, keeping in mind as we ought to do, as he wisely suggests, that far the most ready and rapid way to improve our stock, is to select and raise only the best of our own breed. As this subject has taken deep hold on the public interest, we think we cannot more profitably for the readers of this journal occupy the public attention, than by copious extracts from the Complete Grazier, the latest work on the subject. We shall extend our extracts to every species of live stock.

#### DEVONSHIRE BREED.

This breed is descended from the wild race.

Its *specific characters* are:—Horns of a middle length, bending upwards; colour light red, with a light dun ring round the eye; thin face; hips wide; and thin skin. This breed of cattle is most admirably calculated for draught: though rather small in point of size, they amply compensate for that defect by their hardiness and agility. They fatten early. The Devonshire breed derives its name from the county where the cattle are chiefly bred. The figure above delineated, is from an ox belonging to Lord Somerville, and exhibited at his show of cattle, in 1806.

Of this race there are two varieties: 1. The Herefordshire, and 2. The Sussex. Their colour is red; hair fine; thin skin; horns of a medium length, rather curving up-

wards ; head and neck clean ; hips, rump, and sirloin wide ; thin thighs ; back straight ; chine narrow ; small boned. The animal above delineated has been drawn from a prize ox of that spirited grazier, Mr. Westcar. These two varieties are, in every respect, similar to the parent race :—The cows yield a good portion of rich milk. The Sussex and Hereford breeds occur particularly in the counties whence they are denominated ; also in Kent, and various other parts of England.

#### DUTCH, OR SHORT-HORNED BREED.

*Specific characters.*—Hides thin ; horns short ; little hair ; colour red and white, nearly equally mixed ; tender constitutions. They possess, however, the valuable property of fattening kindly, and yielding large quantities both of milk and of tallow. The principal resort of this breed is in the eastern counties of England, as well as in some of those in North Britain, which border on the German Ocean.

#### LANCASHIRE BREED.

*Specific characters.*—Long horned ; hides firm and thick ; hair long and close ; necks thick and coarse ; colours various, with a white streak along the back ; hoofs large ; fore quarters deeply made ; hind quarters lighter than those of other breeds. Constitution hardy. Milk less in point of quantity, but the cream is of a richer quality than that of other species of neat cattle. The long-horned cattle are principally reared in Lancashire, Leicestershire, Warwickshire, and the chief grazing counties.

Of this breed there is a variety, known by the name of DISHLEY, which is descended from that kind selected, improved, and recommended by the late Mr. Bakewell. This variety is in great request in various parts of England : its *specific characters* correspond, in a very great degree, with those of the parent stock ; but the leg bones are fine, small, and clean ; and the hides are thin. The Dishley neat cat-

tle fatten kindly and in a little time, upon the most valuable points, though yielding but little milk for the dairy, and producing little tallow.

#### GALLOWAY, OR POLLED.

This breed derives its name from the county of Galloway, where, and also in some parts of the Lowlands of Scotland, the cattle are chiefly reared; and whence vast numbers are annually sent to Norfolk, and other English counties, to be fattened for the markets. In general they are without horns, though a few beasts sometimes have two small excrescences depending from the parts where horns usually grow, in colour and shape resembling the long-horned race, though somewhat shorter; hides moderately thick. The Galloway is a most excellent and hardy breed, fattening kindly on the best parts; the flesh is fine grained and well mixed with fat; the oxen are well calculated for draught.

Of this breed also there is a variety, termed the **SUFFOLK DUNS**: they are polled, or without horns; small sized, very lean, and big-bellied; colour, a light dun. Suffolk and the adjoining counties contain the largest number of this variety, which is excellently calculated for the dairy, and yields abundance of rich milk.

#### ALDERNEY, OR FRENCH BREED.

*Specific characters.*—Small sized; colour light red or yellow; horns smooth and neat; of tender constitutions. This breed occurs principally in the south of England, in the possession of gentlemen. The Alderney cows are very rich milkers; their flesh is high coloured, fine grained, and of excellent flavour.

## SHEEP WITHOUT HORNS.

## DISHLEY, OR NEW LEICESTER BREED.

*Specific characters.*—Heads clean, straight, and broad; bodies round, or barrel shaped; eyes fine and lively; bones fine and small; pelts thin; wool long and fine, well calculated for combing, and weighing, upon an average, eight pounds per fleece, when killed at two years old. Fatten kindly and early, being admirably calculated for the market, thriving on pastures that will scarcely keep other sheep, and requiring less food than others. Tolerably hardy and vigorous.

The Dishley sheep are found chiefly in Leicestershire and the neighbouring counties, whence this breed is gradually dispersing through the kingdom.

## LINCOLNSHIRE.

*Specific characters.*—Faces white; bones large; legs white, thick, and rough; carcasses long, thin, and weak; wool fine and long, from ten to eighteen inches, weighing per fleece, when killed at three years, an average of about eleven pounds. Flesh coarse grained. Slow feeders, calculated only for the richest pastures. Constitutions tender. As its name implies, this breed occurs principally in Lincolnshire, and other rich grazing districts.

*Variety 1.* TEESWATER BREED.

*Specific characters.*—Bones finer; legs longer; carcase more heavy and firm; back and sides wider than in the original breed; wool not so long as that of the preceding sort, weighing about nine pounds per fleece, when killed at two years old. Flesh finer grained, and fatter than the parent stock. Females singularly prolific, generally producing two, and often three, lambs each. Constitution



weak. Slow feeders, suited only for the finest pastures, consequently less profitable than the smaller sized, but quicker feeding sorts of sheep. Capable of great improvement, by crossing with new Leicester, or Dishley rams.

This race is bred chiefly in the extensive, fertile, sheltered, and inclosed tracts of pasture watered by the river Tees, in Yorkshire.

*Variety 2.* COTSWOLD, OR IMPROVED GLOUCESTER BREED.

*Specific characters.*—In most respects resembling the parent breed, but superior. They are chiefly found in Gloucestershire. The wool is not so long as that of the original sort. The mutton is fine grained and full sized, and the breed is capable of great improvement by proper crossing.

DARTMOOR, OR DEVONSHIRE NATTS.

*Specific characters.*—Faces and legs white; necks thick; bones large; backs narrow, but back bone high; sides good.

This race is principally confined to the moor, in the county of Devon, whence the sheep derive their name. The wool is long, weighing upon an average, nine pounds, when killed at about two years and a half. This breed improves materially by crossing with the Dishley breed.

HEREFORDSHIRE, OR RYELANDS.

*Specific characters.*—Faces and legs white; size small; carcase well shaped; wool very fine and short, growing close to their eyes, and weighing, when killed at four years and a half, upon an average, two pounds per fleece. Patient of hunger. Flesh fine grained. Constitution tender, so as to require to be sheltered in winter. Very profitable, no breed being supposed capable of subsisting on so small a quantity of pasture as this sort requires.

## SOUTH DOWN.

*Specific characters.*—Faces and legs grey; bones fine; neck long and small; low before; shoulder high; light in the fore quarter; sides broad; loin tolerably good; back bone rather too high; thigh full; and twist good; wool very fine and short, (the staple being from two to three inches in length,) weighing an average of two pounds and a half per fleece, when killed at two years old. Flesh fine grained, and of excellent flavour. Quick feeders. Constitution hardy and vigorous. Capable of great improvement. The South Down sheep are principally bred on the dry, chalky downs of Sussex, whence this valuable breed is gradually being introduced into various districts.

## SWINE.

## BERKSHIRE BREED.

*Specific characters, &c.*—Colour reddish, with brown or black spots; sides very broad; short legs; ears large, and pendant over the eyes; body thick, close, and well made. Kindly disposed to fatten, and attaining a large size, but can be kept only where a large and constant supply of food can be procured, otherwise they will dwindle away, and yield no profit. Flesh fine.

## CHINESE, OR BLACK BREED.

*Specific characters, &c.*—Colour mostly black, though sometimes white, tawny or reddish, and brown; size small; neck thick; legs short; body thick, close, and well made. One of the most profitable sorts in this island; flesh delicate; fatten kindly on very indifferent food: but very mischievous if not well ringed

## GLOUCESTER.

*Specific characters, &c.*—Colour white; size large; legs long, having two wattles or dugs pendant from the throat; carcase long and thin; skin thinner than that of the Berkshire sort; ill formed. A very unprofitable sort; found chiefly in Gloucestershire, Shropshire, and West Devon; supposed to have formerly been the only breed in Britain. Do not fatten so well, or so kindly, as the Berkshire breed.

## HAMPSHIRE.

*Specific characters, &c.*—Colour chiefly white; neck and carcase long; body not so well formed as the Berkshire pigs; size large. Fatten kindly, and to a very great size and weight.

## HIGHLAND, OR IRISH BREED.

*Specific characters, &c.*—Size small; bristles erect; ill shaped. Thrive very badly; prevailing chiefly in the Highlands.

## NORTHAMPTON BREED.

*Specific characters, &c.*—Colour white; legs very short; ears enormously large, often sweeping the ground; size large. Fatten to a large size, but not very kindly; reared chiefly in the county of Northampton.

The SHROPSHIRE BREED appears to be a variety of the Northampton race, to whose characteristics it bears a great resemblance. The Shropshire swine fatten to a large size, but are not so kindly disposed as the Berkshire.

## THE RUDGWICK BREED

Is a peculiar sort of swine, reared at a village of the same name, on the confines of Surry and Sussex. These swine are very valuable, as they fatten kindly and to a

vast size, weighing, at two years, twice or thrice the weight of other swine at that age.

#### SWING-TAILED BREED.

The colour of this breed is various ; its size small, but well proportioned. They are hardy, and fatten to a great weight.

#### LARGE, SPOTTED WOBURN BREED.

This is a new variety, introduced by the late Duke of Bedford ; its size is large, and colour various. These swine are well formed, very prolific, hardy, kindly disposed to fatten, attaining nearly twice the size and weight of other hogs within the same given period of time.

#### GENERAL OBSERVATIONS ON BUYING AND STOCKING A FARM WITH CATTLE.

“The benefit,” observes that enlightened agriculturist, Mr. Young,\* “to be derived from the occupation of land, depends so much on the farmer commanding the requisite capital, that it is extremely necessary for the young beginner to be well advised on this essential point.” Assuming it therefore as certain, that such a beginner is provided with that indispensable requisite, we shall proceed to state a few general hints on the buying and stocking of his farm with cattle ; and shall introduce, under the respective accounts of rearing and breeding the different species, such remarks on their various merits and demerits as will materially assist him in the course of his labours.

The first object of attention, then, is to consider the proportion between his stock and the quantity of feed which will be necessary to support them. The nature, situation, and fertility of the soils that compose his farm are equally worthy of notice, as well as the purpose for which he designs more particularly to rear or feed his cattle ; whether

\* Farmer's Calendar, Ed. of 1804, p. 481.

for the pail, or with the view of supplying the markets. In fact, it will be expedient to observe the greatest exactness in this proportion, because, in case he should overstock his land, his loss will be certain and great ; while, on the other hand, he will incur a diminution in his profit, if he should not stock his land with as many cattle as it will bear.

Formerly, a great prejudice prevailed in favour of big-boned, large beasts, but it has been ascertained, that this breed is, in point of profit, much inferior to the middle-sized kind ; and, by a careful attention to the selection of stock, no inconsiderable progress may be made towards the improvement of the different species. Among the various professional breeders of modern times, few have attained greater celebrity than the late Mr. Bakewell, of Dishley, to whom we are indebted for many new and important improvements in the science of rearing cattle. The principle which he invariably adopted was, to select the best beast, that would weigh most in the valuable joints ; so that, while he gained in point of shape, he also acquired a more hardy breed ; and, especially by attending to the *kindliness* of their skin, he became possessed of a race which was more easily fed and fattened than any other.

Till within a few years, the invariable practice was to judge by the *eye* only, without regarding the other qualities of the animal intended to be purchased ; but, in the present improved age, a more rational mode of forming the judgment is adopted. The sense of touch is now brought in aid of the sight ; and, by repeated practice, the art of judging of the kindliness to fatten has been brought to such perfection, that any well-informed breeder, who has *personal* experience can, on examining lean beasts, tell, almost instantaneously, in what points or parts they will or will not fatten.

In the selection, therefore, of live stock in general, the young farmer will find it necessary attentively to consider the following particulars :

I. *Beauty, or symmetry of shape*; in which the form is so compact, that every part of the animal bears an exact consistency, while the carcass should be deep and broad, and the less valuable parts (such as the head bones, &c.) ought to be as small as possible.\* For working cattle more particularly, Mr. Marshall states the following proportions as being essentially necessary, viz. That the neck be thin and clean, to lighten the fore-end as well as to lessen the collar, and make it sit close and easily on the animal while employed in draught. The carcass should be large, the bosom broad, and chest deep; the ribs standing out from the spine, both to give strength of frame and constitution, and likewise to admit of the intestines being lodged within the ribs. Further, the shoulders ought not only to be light of bone and rounded off at the lower point, that the collar may sit easily, but also broad, to impart strength; and well covered with flesh, that the animal may draw with greater ease, as well as to furnish a desired point of fattening cattle. The back also ought to be wide and level throughout; the quarters long, the thighs thin, and narrow at the round bone. The legs ought, below the knee and hock, to be straight, and of a moderate length; light boned; clean from fleshiness, yet having joints and sinews of a moderate size, for the united purposes of strength and activity. In these points all intelligent breeders concur; but, as beauty of shape too often depends on the caprice of fashion, it is more requisite to regard,

II. *Utility of form*, or that nice proportion of the parts to which Mr. Bakewell bestowed so much attention, and which has already been noticed.

III. The *flesh*, or texture of the muscular parts; a quality which was formerly noticed only by butchers, but the knowledge of which the enlightened farmers or breeders of the present day, have not blushed to acquire from

\* Sir John Sinclair's "Hints regarding Cattle," in the Farmer's Magazine, vol. iii. p. 154.

them: although this quality necessarily varies according to the age and size of cattle, yet it may be greatly regulated by attention to the food employed for fattening them. As a knowledge of this requisite can only be acquired by practice, it is sufficient to state, that the best sign of good flesh is that of being *marbled*, or having the fat and lean finely veined, or intermixed, when the animals are killed; and, while alive, by a firm and mellow feel.

IV. In rearing live stock of any description, it should be an invariable rule to breed from small-boned, straight-backed, healthy, clean, kindly-skinned,\* round-bodied, and barrel-shaped animals, with clean necks and throats, and little or no dewlap; carefully rejecting all those which may have heavy legs and *roach* backs, together with much appearance of offal. And, as some breeds have a tendency to generate great quantities of fat on certain parts of the body, while in others it is more mixed with the flesh of every part of the animal, this circumstance will claim the attention of the breeder as he advances in business.

V. In the purchasing of cattle, whether in a lean or fat state, the farmer should on no account buy beasts out of richer or better grounds than those into which he intends to turn them; for, in this case he must inevitably sustain a very material loss, by the cattle not thriving, particularly if they be old. It will, therefore, be adviseable to select them, either from stock feeding in the neighbourhood, or from such breeds as are best adapted to the nature and situation of the soil.

VI. *Docility of disposition*, without being deficient in spirit, is of equal moment; for, independently of the damage committed by cattle of wild tempers on fences, fields,

\* As this word may probably often appear in the course of the subsequent pages, it may not be altogether irrelevant to state, that it implies a skin which feels *mellow*, i. e. soft, yet firm to the touch, and which is equally distant to the hard, dry skin, peculiar to some cattle, as it is from the loose and flabby feel of others.

&c. which inconvenience will thus be obviated; it is an indisputable fact, that *tame beasts require less food to rear, support, and fatten them*, consequently every attention ought to be paid, early to accustom them to be docile and familiar.

VII. *Hardiness of constitution*, particularly in bleak and exposed districts, is indeed a most important requisite; and, in every case, it is highly essential to a farmer's interest to have a breed that is liable neither to disease nor to any hereditary distemper. A dark colour, and in cattle which are kept out all the winter, a rough and curled *pile* or coat of hair, are, in the popular estimation, certain indications of hardiness; but it is obvious to every thinking person, that this quality, though in some respects inherent in particular breeds, depends, in a great measure, upon the method in which cattle are treated.

VIII. Connected with hardiness of constitution is *early maturity*, which, however, can only be attained by feeding cattle in such a manner as to keep them constantly in a growing state. By an observance of this principle, it has been found that beasts and sheep, thus managed, *thrive more in three years*, than they usually do in *five*, when they have not sufficient food during the winter, by which, in the common mode of rearing, their growth is checked.

IX. A *kindly disposition* to take fat on the most valuable parts of the carcase, at an early age, and with little food, when compared with the quantity and quality consumed in less fertile situations, by which means the supply will be greater for the consumer. On this account, smaller cattle are recommended by C. G. Grey, Esq. ("Letters and Papers of the Bath and West of England Society," vol. x. p. 262,) as generally having a more natural disposition to fatten, and as requiring, proportionably to the larger animal, less food to make them fat; consequently, the greater quantity of meat for consumption can be made per acre. "In stall feeding," the nature, method, and advantages of which



will be stated in a subsequent chapter,\* he remarks that, "whatever may be the food, the smaller animal pays most for that food. In dry lands, the smaller animal is always sufficiently heavy for treading; in wet lands less injurious." And as to milk, he is decisively of opinion, that the smaller animal produces more goods for the food she consumes, than those of a larger size.

X. *The hide* of cattle is also worthy of notice; as, by the simple touch, both butchers and graziers are enabled to judge of their disposition to fatten. Sir John Sinclair has justly remarked,† that, "when the hide or skin feels soft or silky, it strongly indicates a tendency in the animal to take on meat; and it is evident, that a fine and soft skin must be more pliable, and more easily stretched out to receive any extraordinary quantity of flesh than a thick or tough one. At the same time, thick hides are of great importance in various manufactures. Indeed, they are necessary in cold countries, where cattle are much exposed to the inclemency of the seasons; and, in the best breeds of Highland cattle, the skin is thick in proportion to their size, without being so tough as to be prejudicial to their capacity of fattening."

XI. *Working*, or an aptitude for labour: a point of infinite importance in a country whose population is so extensive as that of Britain, and where the consumption of grain by horses has so material an influence on the comforts and existence of the inhabitants. As, however, there is a difference of opinion on this subject, the reader is referred to the fifth section of this chapter, where the question is fully discussed.

XII. Whether kine be purchased for the plough, or for the purpose of fattening, in addition to the essentials already stated, it will be necessary to see that they are young, in perfect health, full mouthed, and not broken either in tail, hair, or pizzle; that the hair *stare* not, and

\* Chap. III, Sect. II.

† "Hints regarding Cattle," p. 157, &c.

that they are not hide-bound, otherwise they will not feed kindly. The same remark is applicable to cows intended for the pail, the horns of which should be fair and smooth, the forehead broad and smooth, udders white, yet not fleshy, but thin and loose when empty, to hold the greater quantity of milk, but large when full; provided with large dug-veins to fill it, and with four long elastic teats, in order that the milk may be more easily drawn off.

XIII. *Age*.—Beside the rules above stated, there are some particulars with regard to the age of neat or black cattle and sheep, which will merit the farmer's consideration.

"Sheep, in general, renew their first two teeth from fourteen to sixteen months old, and afterwards every year, about the same time, until they are turned three years old, or rather *three shear*, to speak technically, when they become full-mouthed; for, though they have eight teeth in the under jaw before, I believe they only cast or renew the six inside ones."\* But, with regard to this point, there is a difference of opinion among experienced shepherds, some of whom conceive that they cast only six, while others think that they renew the whole eight fore-teeth.

"Neat cattle cast no teeth until turned two years old, when they get two new teeth; at three they get two more; and in every succeeding year get two, until five years old, when they are called *full-mouthed*, though they are not properly full mouthed until six years old, because the two corner teeth, which are last in renewing, are not perfectly up until they are six."†

The horns of neat cattle also supply another criterion by which the judgment may be assisted, after the signs afforded by the teeth become uncertain. When three years old, their horns are smooth and handsome; after which period there appears a circle, or wrinkle, which is annually

\* Culley's "Observations on Live Stock," 2vo. 1801, p. 211.

† Cully on Live Stock, p. 208, 209.

increased as long as the horn remains; so that, according to the number of these circles or rings, the age of a beast may be ascertained with tolerable precision, unless such wrinkles are defaced, or artificially removed, by scraping or filing; a fraudulent practice, which is but too frequently adopted, in order to deceive the ignorant or inexperienced purchaser with respect to the real age of the animal.

*Complete Grazier.*

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#### ON THE COMPARATIVE VALUE OF OXEN AND HORSES FOR AGRICULTURAL LABOURS.

**T**HIS is a subject which has already occupied many pages of our Journal, but not in any degree in proportion to its vital importance. The increase of manufactures produces an increase of the use of horse labour, and threatens a change in our habits and usages—a change, which we think would be most disastrous. Whether the recent projects of canals, some of which we apprehend from what we know of this part of our country would be much better on paper than on terra firma, will effect any change in this respect, we cannot say, but this we must believe, that New-England, the whole of it, is deeply interested in preferring the ox to the horse, as an animal for labour. It is pretty well known that horses are chiefly employed in cultivation in England; but there have been always sensible men in that country, so crowded with population—so destitute of extensive pastures, and therefore less adapted to grazing, (except their sheep walks) who have in all ages protested against cultivation by horses.

Recently the question has been agitated in Maryland, with some zeal on both sides, and we have thought we could not render a more acceptable service to our readers, than by giving them the arguments of distinguished cultivators in England on this subject—not that they are new

to us, but the coincidence of opinion will have its deserved weight.

The principal argument of the advocates for cultivation by horses, in Maryland, seems to be the superior speed of the horse. Now this must proceed from an imperfect training of the cattle. With us, our cattle will plough an acre of ground much better, and in as short a time as a pair of horses would do it, unless they can trot their horses in the plough. So they will get in a ton of hay in as short a time. On this topic we beg to introduce some extracts from English and Scotch writers, where all the prejudices are in favour of horses.

“Few subjects have, of late years, more exercised the ingenuity of theorists, and the attention of farmers, than the question concerning the superiority of oxen to horses. The use of these animals, even under many impediments, has been persevered in for many ages, and will continue in every country where a breed of cattle exists which are active of themselves, and of a form and size well calculated for labour. And in the ancient law work, denominated *Fleta*, (which is supposed to have been written about the time of Henry I.) we have indubitable evidence, not only that oxen were then commonly used for the purposes of husbandry, but also of their superiority over horses. The author of that work states, first, that two oxen and two horses will plough as much in one day as four horses: secondly, that in heavy land, oxen made a stronger draught:\* thirdly, that a horse requires the sixth part of a bushel of oats *per diem*, whereas, for a whole week, three one-half measures of oats (ten of which make a bushel) are sufficient for an ox: lastly, that an old horse is of no value, except for his skin; while an ox, after being past labour, will yield a good price when fattened.†

“Equally strenuous in favour of these animals is the au-

\* *Fleta*, lib. ii. c. 73. s. 2.

† *Ibid.* s. 2.

thor of the "Boke of Husbandry," Judge Fitzherbert, who lived in the time of Henry VIII. "It is to be known," says he, "whether is better, a plough of horses, or a plough of oxen, and therein mescemeth ought to be made a distinction. For in somme places a horse plough is better; that is to say, in every place: whereas the husbandman hath several pastures to put his oxen in, when they come fro their warke; there the ox-ploughe is better. For an ox may not endure his warke, to labour all daye, and than to be put to the commons, or before the herdman, and to be sette in a foulde al nyghte without meate. But and he be put in a good pasture all nyghte, he will labour much of all the daye dayely.

"And oxen wyl plowe in tough clay and upon hylly ground, whereas horses wyl stand styll. And whereas is now suerall pastures, there the horse-plowe is better, for the horses may be teddered, or tyed, upon leys, balkes, or hades, whereas oxen may not be kept; and it is not used to tedder them, but in few places. And horses wyl go faster than oxen on even grounde or light grounde, and be quicker for carriage; but they be farre more costly to kepe in winter, for they must have bothe hey and corne to eate, and strawe for litter; they must be well shodde on all foure fete; and the gere that they shall drawe with is more costly than for the oxen, and shorter whyle it will last. And oxen wyll eat but straw and a lyttel hey, the whiche is not half the coste, that the horses must have, and they have no shoes as the horses have." [But the practice is now changed as to this point, and the shocing of oxen, though essentially necessary, is infinitely cheaper than that required for horses.] "And if any sorance come to the horse, or waxe old, broysed, or blynde, than he is lytle worthe; and if any sorance come to an ox, or he waxe olde, broysed, or blynde, he will sell for ii s. and than he is manne's meate, and as good or better than ever he was. And the horse, when he dyeth, is but caryen. And there-

fore, meseemeth, all things considered, the ploughe of oxen is much more profitable than the ploughe of horses.”\*

For the length of this extract from the learned judge, (who was himself a practical husbandman, and consequently has here given the result of many years experience,) its excellence, we trust, will be a sufficient apology; as when taken in connexion with the account of Fleta, it will present a striking record, or document, of the superior utility of oxen over horses. In order, however, that this important subject may be placed in as clear a point of view as possible, we shall proceed to contrast the respective services of the two animals, supporting our remarks on *modern data*; though, probably, some of the preceding strictures may seem to render them unnecessary. And, when it is considered, that oxen, fit for grazing, are now of rare occurrence, it becomes daily a question of greater moment, particularly as it respects the supply of our navy.

### I. *With regard to their original price, or cost.*

The prime cost of an ox, upon an average, is at least one half less than the price of a horse; hence it is obvious that an ox of the value of £. 7 or £. 8 will perform the same quantity of work as a horse worth £. 14 or £. 16. This is a circumstance of no small importance to a young farmer, to whom labouring cattle are the most expensive part of his stock, as he can thus be enabled to branch out his capital into various useful channels.

### II. *With respect to labour.*

By well-known means the nature of the bull is tamed; and, when properly *broken*, the ox becomes as tractable, and may be trained to the plough or to draught as easily as horses. Of this we have numerous instances. Messrs. Culleys of the county of Northumberland, employ 150 oxen

\* “Boke of Husbaudry,” p. 78. Edit. 1767.

in the draught, which practice they have followed, with great success, for more than thirty years. The animals are used singly in carts, and two in a plough, with cords, without a driver; and thus they perform their allotted work of ploughing, carrying corn, dung, &c. in all respects as well as two horses, though not with equal celerity. The late Lord Kaimes states,\* that Colonel Pole, lately deceased, of Radburne, in Derbyshire, ploughed as much ground with *three* oxen, as his neighbours did with four or five horses; feeding them in summer with grass, and in winter with straw, when moderately worked, or, when much worked, with hay or turnips. The late Right Honourable Edmund Burke, at his ground near Beaconsfield, in the county of Bucks, ploughed one acre *per diem* with *four* oxen, while his neighbours performed the same work with an *equal number* of horses.

In ploughing and rolling, oxen are extremely useful. Horses are better in harrows, from their quick step, by which the pulverization of the soil is accelerated: in harvest likewise, when expedition is necessary, horses are preferable. In breaking up old turf-land, however, oxen are better in the plough, their motion being more steady than that of horses; the flag is less broken in turning over, which is a great advantage. For short carriages, as in carting dung, turnips, &c. the advantage of using oxen must be very great; and they may occasionally be used in the plough, when the horses are sent for lime, or to market.†

For the two following facts, which evince the superiority of oxen, even under circumstances unfavourable to these

\* "The Gentleman Farmer," p. 30, 5th Edit. 1802; an interesting and practical work on husbandry, to which we are indebted for some of the following hints and facts.

† Sir John Sinclair's Account of the Systems of Husbandry in Scotland, vol. i. p. 123, which contains numerous important facts relative to the working of oxen.

animals, we are indebted to that enlightened agriculturist, Lord Somerville,\* of whom we have already had occasion to make honourable mention.

At the last meeting, in 1803, of the Dublin Society, his lordship was informed, by a spectator of undoubted veracity, that several ploughs were entered for the prizes given; and, to the surprise of every one, the oxen beat the horses in speed; they were worked in pairs only, without drivers. These animals, he states, were not selected from the breeds most esteemed for labour, but from the oxen of that country.

Of the succeeding instance, Lord S. was himself an eye-witness.—In May, 1803, a meeting was held at Burnham Wyck, in the county of Essex, to award three prizes which were given for the best ploughing. Upwards of twenty ploughs started, three of which were each worked by three pair of oxen, without drivers. These animals were bred on the estate, and of a sort which are deemed by no means well adapted to labour; the horse-ploughs were *picked teams*. The difference of time in finishing the work allotted was, to the best of his lordship's remembrance, about twelve or fourteen minutes between the average of the horse and ox teams; so that, supposing them to be an hour and a half longer in their day's work, the difference in the time of rest will be, if any thing, in favour of the oxen; because animals which perspire by the tongue, do not require the dressing and attention demanded by those whose perspiration escapes by the skin.

The following is his lordship's method of working oxen: the animals are *broken in* at three years old, their first half-year's work being easy. At six years old they are sold to graziers, and in eight months they come to Smithfield good beef. In the intervening period his work is done at the rate of about eighty acres of tillage to four oxen; and his

\* "Farmer's Magazine," vol. iv. p. 343.



twelve oxen, exclusive of the three-years old steers, will work thirty acres of land *per week*, when not employed in carrying lime or manure, which is ten acres per week for each four oxen, or five acres for each pair, that is, two acres *per diem* for four days in the week, for each team of four, allowing them two resting days. Thus their daily labour is completed in seven hours and a half, which gives them sixteen hours for rest. Lord S. remarks, that if they were allowed corn, they would probably do more work; and, if they did less, he would not employ them at all. He allows one horse for every 100 acres of land, for extra work, and no large number.

Lastly. Before we conclude the present contrast, as it respects *labour*, we would observe, that oxen are preferable to horses for *steady* draught, as they uniformly pull to their strength without variation; whereas the last-mentioned animals are apt to stop on encountering the slightest resistance. And though it is objected, that oxen are unfit for draught in mountainous situations. yet, let it be recollected, that under such circumstances no *draught can well be used*; and that the descending of steep hills is, in all respects, as dangerous to horses as to oxen. In addition to the facts already stated, it may be added, that notwithstanding oxen have less air and spirit than a horse, their motion is not materially slower; and as the labours of husbandry are regular and progressive, the step of these animals will be found little inferior to that of the horse. They are, indeed, reputed to be less expeditious for galloping or trotting; but repeated instances have occurred, where Sussex oxen have *beaten* horses at the *ough* in the deepest clay; and the Herefordshire breed is admitted to be superior to any other in long journeys, for conveying chalk, or other heavy substances, over a hilly and flinty country road. In the north of England, we understand that it is not an unfrequent occurrence, to see a light ox saddled, and briskly trotting along the road, obedient to his rider's voice: the

Devonshire cattle also walk with uncommon speed ; and, if four or five horses can till 100 acres of land, the same work might doubtless be equally well performed by a similar number of the Devonshire or Herefordshire breeds, provided they were trained and fed with a special view to *speed*, with the same care as horses.

### III. *Comparative expense of keep and general savings.*

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| <p>1. Oxen are easily supported, during the severity of winter, on straw, turnips, and other vegetables of which a particular detail will be given, <i>infra</i>, Chapter III. Section II. Besides, as ruminating animals possess stronger digestive organs, every thing capable of affording nourishment is extracted from their food.</p> | <p>1. Horses require to be fed, with hay, oats, or beans, articles which can only be purchased at a heavy expense. The digestive powers of a horse are weak, so that, upon an average, two-thirds more are necessary for him than are required by an ox, in order to afford the same nourishment.</p> |
| <p>2. Every day that oxen are employed, they earn more than their keep ; while, if properly fed, they will require no other care.</p>   | <p>2. A horse not only requires more stable attendance than oxen, but also often exhausts the property of little farmers, who exert themselves in order to keep a <i>fine team</i>.</p>   |
| <p>3. The <i>gear</i> necessary for a pair of oxen may be procured at a very moderate price.</p>  | <p>3. The harness of a team is, in general, an expensive article, especially when the vanity of the owner induces him to have it decorated with paltry brazen ornaments.</p>  |
| <p>4. At the end of five, six, or seven years, during which</p>   | <p>4. Horses become less valuable every year they are</p>   |

they will have more than compensated the cost of keeping them, they are in prime order for fattening; and, when fit for sale, produce to their owner a handsome sum, varying indeed according to the state of the markets, but ultimately bringing him a considerable clear profit. The same event will follow, if, through accident, the beast is lamed, or rendered unfit for work.

They are liable to spasms, farcy, glanders, foundering, cankers, and a host of diseases too numerous to be here specified, from all which oxen are exempted, (these animals being subject to few diseases, except a scouring, or looseness, that reduces their value;) while horses are, by sudden illness, or lameness, speedily diminished in value, from *forty* to *four* guineas, and at length become food for dogs, their hide only being in any degree serviceable to mankind.

Another advantage arising from the keeping of oxen preferably to horses will be, the introduction of a more lenient conduct towards those useful animals; and, as has been judiciously observed, in proportion as ox teams are used, they certainly diminish animal suffering; for no man will work his ox team so hard, or feed it, so inadequately, as horse teams are sometimes worked and supported, merely with the view of gratifying a false vanity.

*The following comparative statement of the expense of keeping, management, &c. of horses and oxen, will probably elucidate the facts above attempted to be brought together.*

HORSE.		OX.	
Prime cost of a horse at four years old . .	£.30 0 0	Prime cost of an ox at three years old . .	£.20 0 0
Keep, shoeing, attendance, &c. &c. for ten years, at £.30 per Ann. . . . .	300 0 0	Keep, &c. for ten years, at £.10 per Ann. . . . .	100 0 0
	<hr/>		£.120 0 0
	£.330 0 0	Deduct the value of fat . . . . .	40 0 0
Deduct the value of skin and carrion . . . . .	1 1 0		<hr/>
Total cost of horse . . . . .	£.328 19 0	Total cost of an ox . . . . .	£.80 0 0
Ditto of ox . . . . .	80 0 0		<hr/>
Difference in favour of the ox	£.248 19 0		

#### ON THE COMPARATIVE UTILITY OF HORSES AND OXEN FOR DRAUGHT.

[From the Edinburgh Farmers' Magazine.]

SIR,

As it is evident, notwithstanding the undeniable utility of good draught oxen, that they are now nearly *out of fashion*, (and when that is the case a *good* old fashion is as ob-

solete as a *bad* one), it might have been presumed, that the long continued dispute, on the comparative merits of them and horses, was dying away. However, being in some sort called upon by your correspondent M. Vol. IV. p. 293., who, in a strain somewhat exulting, asks, what I shall say to his statement of work performed on his farm by two horses only, I venture once more to assert the utility of my old favourite the ox.

If your correspondent will have the goodness too look again at the paper he alludes to, I believe he will there find it stated, that my oxen constantly laboured with the heavy draught horses, and actually performed as much work, and to as good purpose; and I have still no doubt that the like quantity of work might be obtained from a pair of good oxen, as he states to have been performed by his pair of horses.

The point at issue appears to me to be this; whether it be possible to obtain as much labour from oxen, as from the heavy black cart horses now so much the favourites of most farmers, even on *small* farms, (for many of these do not exceed 100 acre-), not as from horses of a lighter and more active description, such as the light sandy soils of Norfolk are worked with. If the question is discussed on these grounds, I have little or no doubt the result will be in favour of oxen.

A discussion of the comparative propriety of large and small farms, in this country, would lead us into a very wide field of controversy; for I am by no means an advocate for the monopoly system, that some seem so partial to, of large farms universally, provided the little farmers, especially those of less than 100 acres, would have the wisdom and patience to use oxen, instead of their ruinous favourites the heavy horses, for what little labour they can want, on such small parcels of ground: though it must be allowed that they are induced to plough a great deal more than they can find manure for, on account of the heavy burden and

cost of those animals. Take the country as it is, and not, as many great farmers are wont to say it should be, viz. divided into a great majority of *small* farms, with a most unreasonable stock upon them, of half-worked fat heavy cart horses, it is not difficult to prove that the country at large must lose millions *per annum*, on a fair comparative statement of the expense, &c. of both. For unless we could bring the horse, at the end of his term, into the shambles, he must enter the account as an article of *wear and tear*, or carrion in lieu of good ox beef. Could we surmount our prejudice against the use of horse-flesh, as hinted by another of your correspondents, the whole matter would certainly stand on different ground; and undoubtedly it is deemed good for eating by some nations; yet I confess there is a faintness, and particular disagreeableness of flavour in this flesh, that will probably render it forever unsavory to the palates of Englishmen.

Many persons who have been at the Cape of Good Hope, speak much of the oxen generally used there, not only for ploughing the ground, but for travelling, and that at some speed; nay they usually represent the *horse*, as totally unable to cope with that burning climate, and sandy soil. There is certainly something in this circumstance, in favour of a presumption of the superior usefulness of the ox; he undoubtedly is a patient labourer, and one capable of being made equally docile and tractable with the horse, when proper methods are resorted to, and when proper animals of the sort are chosen for the purpose, which is seldom the case, I must own; for he is *certainly out of fashion*, and nothing short of extreme necessity will bring him into it again.

In order to reduce the argument into small compass, this appears to me to be a fair way of stating it. There is in England a great majority of farms under 100 acres, on which the horses kept are not fully employed; they can pay for their keep by nothing but their labour; therefore

there is a certain loss occasioned by idle and unprofitable horse-flesh. The ox can perform all the work necessary on these small farms; he is extremely valuable for something more than his labour, therefore there is no loss occasioned by idle ox-flesh.

I have a farm of 250 acres, long since let to a substantial tenant, which I know has been worked by eight oxen. I have also a number of small farms, comprising together nearly the same quantity of land, let to seven or eight tenants, on which from 25 to 30 horses are usually kept. What is the balance against the public? Certainly, were all these worked by *oxen*, the public must be a gainer. But consumption is the life and soul of trade;—so says the farmer. Here is consumption with a vengeance; but not a consumption that can possibly benefit mankind, on any enlarged scale of population.—No, no; consumption though a vicious one, may be a very good thing for the farmer; but economical consumption is most for the benefit of the community.

Let us view the subject in all its aspects, and it cannot help striking us very forcibly, that the *horse* is an article of mere *wear and tear*, and of no use to mankind independently of his drudgery; that it is, and ever must be, a *desideratum* in all populous countries, that the whole of their produce should, as much as possible, conduce to the nourishment of the *human* species: witness China, the most populous and best cultivated country in the world, and without horses, which, of course, were not eaten by man, must be considered as joint *tenants* with men, and not, like oxen, subservient to men both in life and death. In fine, we shall come to the conclusion, that the ox possesses strong presumptive evidence of superior utility in this very respect, until the population of any given space arrive at that pitch, that even the *edible* ox with his plough, &c. must of absolute necessity be superseded by *man* and his *spade*, which

of course will bring it, like China, into the *garden* state, or state of highest cultivation, 'where every rood of land maintains its man.'

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#### THE YELLOW PINE.

IT is with feelings of despondency, or at least an apprehension that we shall preach in vain, that we again call the attention of our farmers to the subject of planting, or else sowing for plantations of forest trees. It is indeed extraordinary, that while this Society has for nearly thirty years offered premiums for planting forest trees, they should never have had more than one application for a premium. Now that their premium for a single acre amounts to three times the average value of an acre of land (being one hundred dollars) it is still more extraordinary, and shows the great reluctance our farmers feel at undertaking any thing *new*. How must they be surprized to learn, that it is by no means uncommon in England, for a proprietor to plant out from 50,000 to 500,000 trees in a season.

Let us then abandon the hope of extensive plantations, as being beyond the enterprize and foresight of our population—but let us endeavour on a small scale to introduce one variety of our pine tribe far more valuable than any we possess. Let those of us who can afford it, introduce the cones of this pine, and raise it in our gardens, sure, that it will spread by natural means. When I say *sure*, I will state the facts on which this assurance is founded. Eighteen years since, I planted one or two acres with varieties of the pine and fir-balsam—I can now collect young trees sufficient to plant a considerable quantity of land. I could plant an acre of these young trees of a foot high, with two hands, in a day.

The tree, which I would propose should be introduced



into Massachusetts, is, I believe, foreign to it, and unknown within it; though there may be exceptions. It is what is improperly called the Norway pine—a tree which is found in Maine, New Hampshire, and Canada—in the latter country in abundance.

Of its value, the public may judge by its high price in England, and by the following account of it by Michaux. That we should have had such a treasure so near us for the last 100 years since we became an opulent people, and have made no attempt to introduce it, is certainly not any proof of our enterprize or foresight.

If in every town, one tree had been imported 100 years since, our country would now have been full of it. The Larch does not appear within ten miles of Boston, and then only in small quantities; yet, when cultivated, it furnishes innumerable young plants which may be extended over other grounds, and its value is at least three-fold greater than that of the white and common pitch pine.

M. Michaux the younger, (by way of distinction from his father, the author of a North American Flora, a treatise upon the plants of this country,) was sent out to ascertain the state of our forests, and what forest trees of America would be valuable to France.

He found nearly 140 varieties of forest trees in our country, many of them valuable, while all Europe could only enumerate about forty. Many of these he introduced into France, and it is true that you can find in England and France finer specimens of our own forest trees, than you can see here, even where the unsparing squatter has not applied his axe to the virgin forest. Cultivation has improved them in Europe, and surely it would be a reproach to us to be obliged to send to Europe for the *extinct* varieties of our own trees. We do not mean that they will literally become extinct, but this we mean to say, that they are so much more highly prized in Europe, than in our own country, which gave them birth, that you can import

them from the nurseries of England and Scotland cheaper than you can buy them here. Let us make what reflections we please on this statement, *it is true*.

It may be said, that we have yet wood enough and to spare—but yet we have not *half the variety* in any one section of our country of our *own forest trees*, which France or Great Britain has. *New* to them, they are *valued and cherished*—with us they are neglected. Who ever pretends to cultivate our varieties of Walnuts, peculiar to our country, growing scarcer from year to year? The *Inglans cineraria*, or Cathartica, (the butter nut) which deserves a place on every farm, for its foliage, its rapid growth, its admirable fruit, is neglected in most towns. But we return to the subject of this article, the Red or Yellow pine.—We cannot doubt that if one intelligent man in every town, in this state, would import from Maine or New Hampshire the cones of this tree, and raise a few plants in his garden, in thirty years it would spread over our country by natural means, without human aid. It will take the place of the white pine, of less value for cultivation, and of the pitch pine. M. Michaux thus introduces it:—

*Pinus rubra*, red pine (Norway pine.)

VULGAR NAMES APPLIED TO IT IN THE UNITED STATES.

“*Red pine*—the only name given in Canada, and often in Nova Scotia and some parts of Maine.

*Norway pine*—a name now generally given to it in Maine and the upper parts of New Hampshire and Vermont—but less suitable to it.”

M. Michaux evidently considers it to be a distinct species, and not the Norway pine.

“*Yellow pine*—a name sometimes given to it in Nova Scotia.”

TRANSLATED FROM M. MICHAUX'S TREATISE ON THE FOREST  
TREES OF NORTH AMERICA.

One can scarcely refrain from surprize, that nearly 200 years after the settlement of this country, we should be indebted to a foreigner, who visited our country under the double disadvantage of being ignorant of our language and of the country itself, for the first correct and full account of the riches of our forests.

“THE RED PINE.”

“This tree is known by all the French inhabitants of Canada, under the name of red pine, (*Pina Rouge*) and the English inhabitants of Canada, their successors, have adopted it. In the northern parts of the United States, such as Maine, New Hampshire, and Vermont, it is called the Norway pine, though it differ entirely from it, the Norway pine being the *abies picea* of Europe. It would be therefore desirable that the name of *Red Pine* should be applied to it, in the United States, for reasons which we shall state.

In the voyage made by my father (the elder Michaux, author of the North American Flora) to endeavour to decide in returning from Hudson's Bay to the South, the appearance and disappearance successively of the several varieties and species of trees and plants of North America, he did not find the red pine, till he arrived near the lake St. John in Canada, in the 48th degree of north latitude, and it disappeared in the south beyond Wilkesbarry in Pennsylvania, in  $41^{\circ} 30'$ . (So that it is clear that it would very well grow in all parts of Massachusetts.)

The red pine is indeed very scarce in all the country south of the Hudson. You find it in Nova Scotia, where it is called, as in Canada, the red pine, and sometimes the yellow pine, (by which name it is most frequently known in Massachusetts, though the tree is rarely if at all found growing there.)

Mackenzie in his voyage to the Pacific Ocean found it growing to the westward of Lake Superior.

In no part of the United States does it form large forests, or enter in a considerable degree into their masses, but is found in large detached parcels by itself, or mixed with other trees. Like most of the other species of this genus, the pines, the red pine is found in dry and sandy soil, and its vegetation is not the less magnificent on this account, for it rises to the height of 70 or 80 feet, with a diameter of from 20 to 24 inches, and what is very remarkable in this tree, is its uniform thickness or diameter for at least two thirds of its height.

The name of Red Pine, which it bears in Canada, owes its origin to the colour of the bark, which is of a more decided red than that of any other pine in the United States. It appears to me that this character is so distinct and remarkable, as to justify the preference of this name to that of "resinous" Pine, given to it by late botanists. Another reason for preferring this name is, that many persons would be led to believe, if the name of resinous pine was given to it, that it was from this tree the resinous substances employed in naval architecture, and exported from America, were derived, which is not true. The concentric circles or annual growth of this pine are very close, and its wood presents a fine grain extremely compact. It is indeed quite heavy, owing to the quantity of resinous matter in it. In Canada, Nova Scotia, and the District of Maine, it is much esteemed for its strength and durability;—it is therefore much employed, especially for the decks of ships, because it will furnish pieces of 40 feet in length, without a knot. It is also employed for pumps. Its vegetation appeared to me to be vigorous, and I have no doubt it will succeed well in France and in all the north of Europe, and I think that the good qualities of its wood fitted for naval purposes, as well as the resinous matter which it will furnish, ought to induce France to encourage the cultivation of it."

If it will succeed in France it must in Massachusetts, and it certainly would be an excellent substitute for our pitch pine. There can be but little doubt, that if a few plantations of it were scattered through Massachusetts, it would soon take care of itself, as the barberry and many useless plants have done.

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UPON THE DETERIORATION, OR THE DECEPTION IN CLOVER  
SEED IN THE BOSTON MARKET.

IT is now nearly seven years, since I perceived among the seed purchased for red, or the great Dutch broad leaved clover, (which is the sort we principally cultivate,) a mixture of yellow clover or Melilot, (the *Trifolium officinale*, as I presume, of Dr. Bigelow.) It has been constantly increasing in quantity in the seed I have purchased, and the last year, I found in laying down nearly two acres of ground more than two thirds of the seed purchased produced the yellow clover, so that my crop is nearly ruined. It is said to be very grateful to horses, but its stalk is very feeble—it is subject to lodge, and of course to rot. It is very difficult to mow and to cure, and on the whole, should be condemned as a weed. Are there any obvious means of detecting it in viewing the seed? If there are, what are they? Are there any measures which can be adopted to give us security against this provoking evil? Inspections are resorted to as to articles of export. Perhaps this subject would be deemed too unimportant for legislative provision. But it is an evil of some magnitude, and we should be obliged by any hints of the best means of guarding against it.

J. L.

*Roxbury, May 23, 1825.*

## ANOTHER PRESENT FROM MR. KNIGHT TO THE HORTICULTURISTS.

THAT distinguished friend of physiological science, and of horticulture, Thomas Andrew Knight, Esquire, of Downton Castle, near Ludlow, Salcp, has recently sent a box containing valuable fruits. We cannot omit this opportunity of remarking upon his enlightened and disinterested zeal, not merely for the improvement of horticulture in his own country, but in others. He has enjoyed the advantages afforded by a very liberal fortune, which has enabled him to pursue his favourite occupation under unusual advantages. It will not diminish our respect for him to know, that he was one who opposed the war with America in 1775, and he has continued its steady friend to this hour.

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*Letter of Mr. Knight to John Lowell, President of the Massachusetts Society for promoting Agriculture.*

[The Letter is not dated, but probably bore date early in March 1825.]

MY DEAR SIR,

I have this day sent a box to Messrs. Thomley of Liverpool, containing plants of the different varieties of figs cultivated in this country. As to names, it is perfectly useless to give any, for the fig tree is an extremely long lived plant, and the scions springing from the root probably furnish plants capable of being cultivated through an immense period, and the ruined gardens of almost every monastery appear to have afforded plants of the fig tree. We have, in consequence, one variety known by two or three different names, and two or three varieties known by the same name. We therefore only write from what gardens they were derived.

You will soon discover the sorts which are best adapted to your climate.

I have put into the box a plant of the Pear d'Aremberg, a most excellent variety.—It is labelled No. I. A branch (or cutting) of the Sylvanche verte d'Hyver pear tree (I had no tree) is marked No. II.; this variety bears well, and is excellent in my garden.

A plum tree with some cuttings of the Downton Imperatrice Plum described in the Horticultural Transactions last year by Mr. Sabine. It hangs and shrivels on my walls, and in the month of November it is (as Mr. Sabine states) very excellent. It is a most productive variety.

A budded tree, which shot two branches last season of an *apple* which was sent to the London Horticultural Society, as the “Mela Carla” supposed to be the best apple of the world, with some cuttings of the same—some grafts or cuttings of an apple which we call in Herefordshire, the Brandy apple, from the excessive strength of its cider—it is also a fine desert or table apple in very hot seasons. It is sometimes called the Golden Hervey. I have made an effort to convey to you eight varieties of our best strawberries.

I trust that I have so packed them that they will arrive safe. No. I. is Kean's seedling, and No. VIII. is the Downton Strawberry—the others are quite new, and are probably the largest strawberries in existence; a single berry grown in my garden last year weighed 558 grains, and many others approximated that weight. The weight and beauty of Kean's seedling have caused it to be much cultivated for the London market. I however think it to be the least good of those which I send you. I send also some improved varieties of the red currant.

I send also some scions of the Hardenpont de printems

pear, which I know to be correct, having been taken from a bearing tree, and marked instantly by my own hand.

Yours,

TH. A. KNIGHT.

JOHN LOWELL, Esq. *Roxbury, near Boston, Mass.*

The above mentioned present to our country has safely arrived by the brig "La Grange." The plants are all in a growing state.



#### ON THE IMPROVEMENT OF SOILS.

WE need make no apology to our readers for quoting the remarks of the justly distinguished Mr. Young, of Nova Scotia, on the improvement of soils, by other processes, than the familiar one of applying manure. It is now practically well known to most of our intelligent farmers, that cold and wet meadows are at least as much, and probably more permanently improved by carting on sand, than by any rich manure which we can possibly apply; but we have not generally practiced the application of sand to stiff clayey soils, nor of lime to any soils. The following remarks may therefore be interesting to that class of our readers who love to think, (and we hope there are many in our country who do so,) and who are desirous of applying to agriculture that understanding which was given to them for nobler purposes than merely acquiring the knowledge of ancient practices in the agricultural art, and the manual skill of applying them. If farmers will take the trouble of reflecting on the condition of their own art in the earliest periods of the world, and consider, that every implement or article facilitating labour, which they now *use* and consider as familiar, were the results of human ingenuity and invention; if they will recollect, that all the plants they now raise were comparatively miserable in their natural state, before the industry



of man had rendered them fit for human food, and for the subsistence and perfection of domestic animals, they will probably not rest contented with the knowledge which they now possess. They will perceive, that the surface of the earth is as susceptible of improvement as the plants which grow upon it; and they will be eager to ascertain the laws, or rules, (not human laws and rules, but those of Providence) by which good soils are made. All our good soils are the result of chemical and mechanical changes. Nature is constantly at work to aid us; but we can by studying the processes by which she operates, improve her gifts more rapidly.

All the common and most familiar processes of Agriculture are nothing but an attempt to aid nature. Every farmer, without knowing it, is in fact a chemist and natural philosopher. He breaks up his ground, because he finds the grass will not grow as well as he could wish; by this process he enriches it by the food he furnishes to future plants, by the rotting and decomposition of the old—by pulverizing and mellowing the earth, and thus permitting the new plants to strike deeper roots, and to grow more vigorously. If the farmer will only pause one moment, he will see that his old practices are founded on principle and on human discovery. He knows not the *man*, the individual who made the improvement, but it was human intellect which effected it. Yes—without irreverential disparagement to the Author of all our blessings—it is man, who has made Agriculture, what it now is. It was God, who ordained that man should work for his subsistence, and gave him the faculties and powers to enable him to do it. But his law is, that we shall *use* these faculties, otherwise the earth will not produce its increase. Take for an example, the practice of the French inhabitants of Canada who, for a century, would not use the manure produced by their cattle. Could any thing be more absurd?

J. L.

*Letter 15th of Agricola. By MR. YOUNG, of Nova Scotia.*

After having travelled over so wide a field of illustration, in the course of which I have touched on many topics of interest and instruction, I now approach the last and most important point in the second section of my plan. If my readers have been at all attentive to my strain of argument, and made themselves masters of the multiplied views I have exhibited, they will find no difficulty in appreciating the fitness and efficacy of the remedies which I am about to prescribe, in order to rectify the natural defects, and conquer the untoward qualities of different descriptions of soil lying within the bounds of the Province. It is only by having recourse to first principles, and laying them down in order and with precision that any thing like system can be introduced into the practice of husbandry: and the advantages of this when grounded on experience and placed under the direction of this faithful and unerring monitor, are manifold and apparent. There should be nought like quackery in Agriculture—no authoritative tone of dictation to the farmer without assigning satisfactory reasons for the practice recommended: for this profession is not a piece of patch-work, made up of arbitrary rules and doubtful maxims handed down immemorially from father to son, but it is a science, which walks hand in hand with philosophy and takes the full benefit of her lights and which disdains to command, till it informs the understanding.

I need make no apology for taking a slight retrospective glance of the leading doctrines I have delivered on Soil, in order to comprise them into one view, and set them, as it were, before the eye of the mind in a conspicuous and impressive attitude. I have said, that the soil serves three purposes in the process of vegetation: it furnishes a bed in which the roots expand themselves, in order to give firmness to the stem, and collect the necessary nutriment; it is the

laboratory in which putrefaction goes forward, and it has the capacity of fixing and absorbing the gases or streams set at liberty during decomposition; and it also chiefly supplies the moisture to the plants which live and grow upon it. To answer these ends, Nature must have either formed the mould, which, like a robe, invests the habitable Globe, of a triple and corresponding character: or she must have spread and blended into one composition different materials adapted to these essential purposes of vegetation. She has made choice of the latter plan, and it opens an interesting and beautiful view of design, to mark the qualities of the primitive earths in connexion with their subserviency to the vegetable kingdom. To render the surface penetrable by the roots and the smaller fibres, and to keep it open and friable, sand or gravel are provided in such abundance that they pervade both the old and new Continents, and are met with in all countries and climates: to render it again retentive of moisture, that the plants which vegetate most vigorously in hot weather, might not be parched by excessive drought, clay was thrown into the heap, and blended with the sand: and lastly to render it a fit laboratory for resolving animal and vegetable matter, and applying it to use, lime was added, which assists the putrefaction and also enters into combination with the liberated carbonic acid. Magnesia—the scarcest of all the four primitive earths—serves as a substitute for lime, and is productive exactly of the same effects; but as a calcareous earth supplies its place, taking the most favourable view of its efficacy, it is distributed with extreme parsimony, and in most cases, is entirely dispensed with. Here we behold a beneficent adaptation of means to ends in the constitution of the elements of soil, and the purposes of vegetation are promoted by corresponding earths, which are profusely scattered everywhere, and in many places are compounded by the laws of matter, and made ready for use.

If these illustrations be just, every soil is more or less

defective in proportion to the absence of one or more of these ingredients, and when perfect and capable of the utmost productiveness, it must arise from a due mixture of the whole. Hence originates a curious question, which has attracted a considerable degree of notice, but has not yet received any satisfactory and definite solution: What is the proportion of the primitive earths, which forms the most fertile soil? To ascertain this with some tolerable accuracy, the analysis of various soils has been undertaken by chemists, and the products of each have been noted and compared. Mr. Tillet,\* in some experiments made at Paris, found that a soil composed of three eighths of clay, two eighths of sand, and three eighths of finely divided limestone, was very proper for wheat. Mr. Henry examined a fertile corn soil in East Lothian, Scotland, and divided it into 100 parts. Of these, the clay amounted to 45, the sand to 25, the calcareous earth to 11, the vegetable manure to 9, and the water in absorption to 4, and the remaining 6 were taken up in chemical compounds, chiefly the sulphate of lime. He submitted, also, to the test of experiment a soil from Somersetshire celebrated for producing excellent crops of wheat and beans, and found it to consist of eight ninths of calcareous marl—a compound of clay and lime—and one ninth only of sand. Sir H. Davy† discovered, that a soil, containing eleven parts out of twelve of sand, could yield a tolerable crop of turnips; but, if more sand was added, it became absolutely sterile. From these opposite results this legitimate deduction may be drawn, that the productiveness of the earth does not depend on any exact proportion of the primary ingredients, and that a very great latitude is allowable in their composition: and this is analogous to that law of variety which is observable in other arrangements, and seems to govern all the operations of Nature. It cannot, however, be denied, that this remark

\* Henry's Chemistry, p. 426.

† Farmer's Magazine, vol. 16, p. 482.

applies more particularly to the clay and sand—the two principal ingredients—which from the above experiments may be mixed up and assorted from one ninth to eleven twelfths : that is, a soil may consist of clay except a ninth part of sand, or of sand except a twelfth part of clay. These two extremes so wide of each other, leave a vast intermediate space to be filled up, and account for the almost infinite variety of loams,—truly productive—that are met with on our globe. But lime must not be introduced into the composition of soils with the same freedom of admixture. Its beneficial qualities are only exerted when a moderate dose is applied ; and it is universally pernicious when existing in excess. Magnesia is equally, and in all probability more so ; for many are of opinion, that it acts even in the smallest quantities as a poison to vegetation.

These views will be found highly conducive to the right understanding and judicious application of the remedies, to which the farmer should have recourse in rectifying the defects of any field he is solicitous to improve. He has only to inquire, which of the original ingredients is wanting, and then endeavour to find it at the easiest and cheapest rate : for he may be assured, that the utmost fertility is unattainable without the presence of all the elementary substances.

Under the guidance of these conclusions, and aided by the lights which they afford, I shall proceed to examine shortly all the descriptions of soils found in Nova Scotia, and appropriate to each a few practical observations.

1. *Marsh*, the formation of which was explained last week, is compounded of all the primitive earths, and is confessedly the best of all our soils. It requires to be embanked against the ocean, that it may become fit for tillage ; but in all other respects it is placed beyond the help and operations of art. The ingredients are so happily mixed, that any attempt to modify them would be injudicious tampering, and as likely to issue in its deterioration as its im-

provement. I am far, however, from the belief, that it can be cropped for hundreds of years, without impairing its natural productiveness; and all our ideas of a perpetual fertility, independent of fresh supplies of animal and vegetable matter, are mere chimeras of a speculative imagination. Every successive crop vegetates at the expense of the decomposing dead substances in the soil, and draws from them its strength and nourishment. The original store, therefore, must become exhausted in proportion to the number of years the land has been under cultivation, and if these be extended to an indefinite length, the inevitable consequence must be, the extraction of the whole nutriment. In conformity to this hypothesis, it has been found, that the rich meadows in America, which were supposed to contain the elements of an inexhaustible productiveness, have been much sooner worn out than was expected, and thus blasted the idle and unsubstantial hopes of visionary projectors. The same result must follow in Nova Scotia, if our marshes are laid under an uninterrupted course of cropping, and neither renovated by the application of manures nor repaired by lying in pasture. To this conclusion experience has now brought an accession of strength, and the diminished produce of these fine levels is an incontestible evidence of the erroneousness of that theory which has been set up in despite of the first principles of vegetable nature. True it is, that some of our marshes, and I believe spots in the *Grand Prairie* of Horton may be instanced as an example, have been under wheat and grass alternately and in succession, for more than a century past, and have not been replenished during that long period with any sort either of fossil or putrescible manure; but the fertility is here preserved by the uniform practice of laying out these marshes to grass, and keeping them so for several seasons. Notwithstanding this interval of rest, which to a certain extent recruits all soils, the produce of our best marshes may now be estimated at from 12 to 15 bushels.

which is not the half they once yielded, or would again yield, were a different system of management adopted by giving them a certain portion of the barn manure. This is the genuine and substantial food of vegetables, and on nothing else will they *fatten*, if I may be permitted to borrow this term from the animal economy. It is pitiable husbandry to extract from such excellent lands these diminutive and insignificant crops.

II. The fresh water intervals are our finest loams; because the clay and sand of which they are formed have been blended by the deposition of the floods, and consist altogether of the minutest particles of each. I am satisfied, that the application of lime to these would be of incalculable benefit, as furnishing a quickening and stimulating substance, which would assist putrefaction, and serve to fix and absorb the fructifying gases. Some of them, I am certain, already contain a portion of calcareous earth brought down by the torrent; but in none of them which I have examined, does it exist in sufficient abundance to exercise its full activity; and all of them would be greatly improved by the use of this excellent and valuable fossil.—Too great a dose in the first instance need not be given; and although the expense of 60 or 80 bushels per acre swells into magnitude in the eye of a farmer, he should recollect, that the benefits of liming are permanent, and are felt for thirty years afterwards.—Lands have been limed in Scotland at the rate of three hundred bushels per acre.

III. Upland loams are exactly formed of the same materials with interval; but the mixture is not so complete, and the parts are of a coarser and bulkier description. The loams generally in the Province are inclined more to sand than clay, and on that account are admirably adapted to the turnip husbandry. By tillage they could be pulverised into a fine soil capable of producing all sorts of green crops—and I hope the period is not very remote, when their capability shall be put to the test. Lime would be a great

and beneficial improvement to them all, as it is the only ingredient wanting to complete and perfect their composition. The quantity that should be laid on, must depend on many circumstances, so that no rule which I could prescribe, would be of general applicability, and I fear the expense of burning and transporting it will operate with most farmers in making them lean too much to the safe side. When the practice of liming was first introduced into Great Britain, which is only about 70 years ago, the tenants of those days proceeded with great caution, and harrowed in a very inconsiderable quantity: but afterwards, when its beneficial effects were palpable and acknowledged, they advanced with more boldness, and applied from 150 to 250 bushels per English acre. The luxuriance of the succeeding crops justified their most sanguine expectations, and quickly repaid this vast outlay. This success encouraged to farther efforts; and many of them laid on a second time as large a quantity as at first. But this after-dose was not accompanied with the same striking advantages, nor offered so sure a prospect of remuneration. Some tried a third, but this was followed by no sensible improvement; and in general the capital expended on the second and third limings was never replaced; and in many instances, a visible deterioration in the productiveness of the soil was the unfortunate consequence. This experience corrected the hasty conclusions drawn from the first attempts; and it is now a recognized maxim in British Agriculture, that an overabundant dose should be cautiously guarded against, but that it is perfectly safe, and highly beneficial to apply it to the extent of three or four hundred bushels, and in some few soils of stiff clay, in a greater quantity, though not all at once, but the one half at an interval of a complete rotation of crops. I conceive, there is no great difficulty in assigning the cause of this disappointment. Lime is one of the original ingredients of which a perfect soil is composed, and an excess of it as well as of any of the others must be a defect, upon those principles which



have been already illustrated ; and as only a very small portion enters into the organs of plants and is necessary to the constitution of their fibre, perhaps the soil should contain only a quantity proportional to the wants of vegetation. Whether this be the philosophical explanation of the difficulty is of immaterial consequence ; since the fact itself is certain and undoubted, and has led to a more temperate and guarded use of calcareous earth.

Further, it may be applied to our loams either in the shape of quicklime as it comes from the kiln, or in that of a carbonate, as pounded limestone, marl, marsh mud, or in short, any modification of it found in nature. Quacklime is so easily pulverised, and in that state capable of so intimate and close an union with the soil, that a preference is naturally given to it in the general system of farming ; but marl may be used as an excellent substitute, and with almost equal success. Through the medium of one of my correspondents, I am in possession of a specimen of very fine marl, taken from Mr. Cunningham's lands in Windsor, which would form a valuable manure for light and common loams.—The value of marsh mud on uplands is derived from a variety of circumstances, which combine to render it a capital manure ; and too much attention cannot be paid to this great and inexhaustible store of agricultural riches. To sandy loams, it supplies a quantity of clay which they need, in order to acquire tenacity and adhesion ; to poor and wornout soils, it becomes a valuable dressing from the remains of animal and vegetable substances incorporated in its formation ; and to all uplands, it affords a quantity of lime—from the disintegration of calcareous rocks, particles of which have been washed into the sea by the ceaseless action of torrents,—and from the decomposition and gradual destruction of shells.

IV. Sandy or gravelly uplands, in the present state of this colony, are hardly worth cultivation : for it is egregious folly to waste capital on unproductive barrens, while there remain in a state of nature, and unappropriated, such vast

tracts of improvable loam ; yet as the general principles which I have laid down are applicable to all soils, and as some sandy patches are comprehended within the limits of our cleared settlements, it may not be amiss, briefly, to chalk out, with regard to them, the obvious line of procedure.—What they want is a binding and tenacious substance—retentive of moisture—and clay in this case presents itself as decidedly the best manure. We previously mentioned, that eleven parts of sand with one of clay would constitute a soil, that would yield a tolerable crop of turnips ; and therefore, to spread over the surface half an inch of clay, and afterwards to mix it up with the soil to the depth of six inches, must effect the cure of its barrenness. A greater proportion would be desirable ; but this is the least at all consistent with fertility, and if to this mass so compounded, were added clayey marl, and dung, it might be brought slowly to a productive and vegetative mould.—It was the adoption of this method, that laid the foundation of the Norfolk husbandry, so justly celebrated in Young's *Eastern Tour*.<sup>\*</sup> That county in England, before the middle of the last century, was a wide and worthless tract of sand, rented only, as sheep-walks, at about 1s. 6d. per acre. It possessed one natural advantage, to be found perhaps nowhere else to an equal degree ; its subsoil consisting of a white and yellow marl or clay. On the first discovery, the farmers spread this in large quantities, many of them at the rate of 80 loads per acre, and afterwards they reduced it to 40 and 60. The benefit of this first layer lasted for thirty years, and then half as much more replenished the exhaustion. Rents rose rapidly to twenty shillings per acre ; and this mixing of clay with sand gave rise to a particular routine of cropping—known by the name of the Norfolk System, which we will afterwards take occasion to explain.—The fact is, that wherever Nature has not blended three prima-

<sup>\*</sup>Bath Society Papers, vol. I. p. 19, 20.

ry ingredients of soil—sand, clay, and lime—it is necessary that the deficiency be supplied by the operations of man.

V. Clay, in its unsubdued state, is the most barren of all soils, and requires more than any other an expenditure both of capital and labour. It may seem paradoxical to recommend the laying of sand\* on this stubborn earth, but wherever it can be easily procured, it is the most certain and infallible remedy, and will much sooner work the effect.—About 14 years ago, in another country, I rented a small field, which consisted of a friable loam, except one corner, where protruded on the surface a stiff and unyielding clay, which had proved so obstinate to the former occupiers, that they had given it up in despair, and it was accounted hardly worth seed and labour. Previous to my possession, it had been limed and manured, and more than once subjected to a naked fallow, and still its refractory nature refused to be tamed, though rich in calcareous and decomposing matter. About this period I recollect, that Miller's Dictionary on Gardening and Agriculture fell into my hands; and under the article Earth, which any of my readers may consult at their leisure, he recommends sand as an efficient manure for fat borders; and stated that the gardeners about London were in the practice of using it, to restore the virgin temper of the soil in lieu of trenching; and also that it would prove useful on "clays, to open the pores, give freedom to the circulation of the sap, and make way for the extension of the roots." I formed at once the determination of making the experiment on my barren corner, and proceeded to cart *dead* sand from the pit, and spread it on the clay about the thickness of an inch, mixing it well with the whole soil. A sagacious neighbour of mine was highly tickled at the oddness of my conduct, and jocularly rallied me on converting a sand pit into a dung yard. This application, however, wrought like enchantment; and

\* Young's Calendar, p. 42.

to his confusion, and my own astonishment, the crop surpassed all expectation, and was fully equal to what grew on the other parts of the field. The cure was complete; for ever after while under my management, that piece vied with the rest in native productiveness.

From all this reasoning it seems deducible, that *sand* and *clay* in almost any proportions, with a quantity of *lime* laid on with judgment, but not in excess, constitute the best and most fertile soil; and that the only mode of improvement is to supply whatever sort of these original and elementary ingredients is deficient in the composition. But all this will be far from bestowing lasting fertility, unless to the mass be added decayed animal and vegetable substances, which unquestionably minister to plants their principal food and nourishment.

AGRICOLA.

*Halifax, Oct. 21, 1818.*

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#### ON SALT, AS A MANURE, AND AS PROMOTING THE HEALTH AND FATTENING OF DOMESTIC ANIMALS.

IT is natural, that cultivators should be constantly employed in searching for some more convenient, cheap, and expeditious mode of increasing the growth of plants. In all countries, and in all ages, the ingenuity of man has been exerted to procure such ready modes of advancing agriculture. Although we have no strong confidence, that any improvement of art or science will ever give us a good substitute for the natural manures, arising from the dung of animals, partly consisting of animal, and partly of vegetable materials; yet it is unquestionably true, that science may come in aid of these obvious and common expedients. There can be no question that the application of sand to clayey and wet soils is highly beneficial, and the singular effect of gypsum, (a discovery of very modern date) the

changes which it produced, as yet not satisfactorily explained, may lead us to hope, and justifies the expectation, that much may be effected in aid of common articles of manure—*certainly never to their exclusion*, by scientific discoveries. The use of lime was the effect of scientific reflection, and in countries where lime can be obtained at cheap rates, the evidence is perfect that it is a most valuable addition to our list of manures. All the scientific farmers of Europe are at work to find out some cheap article, easy of transportation, which will come in *aid* of the *natural manures*.—No man of sense is so absurd as to expect that they will ever be superseded. The French cultivators have recently advertised their “*poudres vegetatifs*,” (powders promotive of vegetation,) and recently there has been a suggestion that the oxymuriate of lime applied in a liquid state is a most powerful manure. We shall institute without too sanguine confidence in its success, some experiments to test its value. We have doubts of its applicability to cultivation on the great scale, yet we see no reason why, if the statements are true, as to its effects, it should not be applied to fields of corn with as much effect, and as much ease, as the putting a table spoon full of gypsum in each hill. This is in itself a miracle never explained, and we may have other miracles *in store* for us, as great. There is one discovery which is unquestionable, and hitherto never applied to agriculture, though most abundantly established by irresistible evidence in *Horticulture*, and that is, the superiority of manures applied in a liquid state—when we apply a shovel full of dung to a hill of corn, or potatoes, a very small portion of the fertilizing matter can be taken up by the plant. It is proved—it is clearly proved, that if the goodness or the essential qualities which promote vegetation are extracted by submersion in water, and applied to the plant, the effect is very great. How far this admitted and well established fact can be applied to agriculture generally, may be doubted.

It certainly could not be applied to fields of rye, wheat, or barley; but possibly it might be to Indian corn and potatoes. We throw out the hint only, because it is as well proved, as the fact, that gypsum acts powerfully on the growth of plants, that liquid manure in gardens, upon trees and shrubs, has within the last ten years produced surprising effects.

We return to the subject of the present article, Salt, as a manure, and as promotive of the health and growth of animals. There has been a vast deal written both in its favour and against it. It is well known that applied in too great quantities, it is destructive of vegetable life; and it is equally well known by the case of sailors, fed on salt provisions, that in excess, it is equally destructive of animal life and health. This, however, is equally true of almost every other useful thing;—still we should not reject it, because its abuse may produce an evil. Much has appeared on the subject of salt as a manure, and as a condiment, or excitement to the appetite of animals, but we think that the whole subject was never so thoroughly discussed as it was in Great Britain on the proposal to repeal the duties on salt, and we shall therefore lay before our readers at the risk of repetition, all the evidence collected on the subject of the value of salt in its two separate and independent uses, as a manure, and as contributing to the health of animals.

We shall make our extracts from a work written by Samuel L. Parkes, Esq., member of many learned Societies in Europe, and corresponding member of our own Society for the promotion of Agriculture—a learned and indefatigable man devoted to science and to the cause of human improvement. His work is chiefly a compilation of all the authorities, ancient and modern, on the value of salt, for various agricultural purposes, and we know not, how we could possibly devote the pages of *one* number of our journal better, than by laying before our readers, in this condensed form, what they could not learn, without extensive libraries,

and much reading. Indeed, such is the chief value of journals like our own, to place *within the reach of thinking and reflecting men*, the *labours of others*, who have had *access to books which they* (our readers) *cannot procure*. Of course, it will be understood, that we neither vouch for the soundness of the opinions of the various authors quoted, nor for the accuracy of *their experiments*;—but it is much better to know what *has* been thought, and said, upon any subject whatever, than to be *entirely* ignorant of it. With this view alone, we present the whole mass of authorities cited by Mr. Parke on a very important question agitated in England, on the proposed repeal of the duties on Salt.

“Dr. Holland, in his Agricultural Survey of the County of Chester, has clearly shown the good effects resulting from the use of salt on grass-lands, and also as a manure for wheat and barley. Among other instances he relates the following:

“After draining,” says he, “a piece of sour rushy ground about the middle of October, some refuse salt was spread upon a part of the land, after the rate of eight bushels to the acre, and in another part sixteen bushels. In a short time the vegetation disappeared totally, and during the month of April following not a blade of grass was to be seen. In the latter end of the month of May a most flourishing crop of rich grass made its appearance on that part where the eight bushels had been laid. In the month of July the other portion produced a still stronger crop; the cattle were remarkably fond of it; and during the whole ensuing winter (which is ten or twelve years since) and to this day, the land retained, and yet exhibits, a superior verdure to the neighbouring closes.”

*Dr. Holland's Survey of Cheshire.*

Dr. Darwin, in treating of salt, as a manure, observes, That it is a stimulant that excites the vegetable absorbent

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vessels into greater action than usual; and in a certain quantity it increases their growth, by enabling them to take up more nourishment in a given time, and consequently to perform their circulations and secretions with greater energy.

The late Thomas Butterworth Bayley, Esq. who was a Fellow of the Royal Society and Honorary Member of the Board of Agriculture in London, in his *Thoughts on Manures*, after enumerating nineteen different substances which improve land, adds, "There is another source of improvement LOST TO THE COUNTRY, but *not through the fault of the farmers*, viz. refuse rock-salt, and refuse liquor from the salt-works. I trust the very impolitic restriction which forbids the use of this valuable manure, and causes its *total loss*, will soon be removed by the exertions of this Society and those of the Honourable Board of Agriculture."—*From an Address read to the Members of the Agricultural Society of Manchester, October 22, 1795.*

Some years ago the Earl of Dundonald, who was anxious to obtain the repeal of the salt duty, drew up a list of articles to be submitted for taxation in lieu of salt. At the bottom of the schedule he adds the following observation. "The preceding statement," says he, "does not include the duty on rock-salt employed either in the state of salt, or when prepared into *Glauber salt* or *mineral alkali*, as a manure, and which can be afforded to be done, paying a duty of thirty shillings per ton. The consumption *for this purpose* may probably in a few years, when the benefit from the use of salt, or the saline substances prepared from it (*as a manure*) is generally known, amount at the most moderate calculation to FIVE TIMES the quantity of salt consumed in Britain FOR ALL OTHER PURPOSES."—Copied from *Earl Dundonald's Evidence before a Committee of the House of Commons in the year 1801.*



Although sufficient evidence has, I presume, been already given to prove the efficacy of common salt in promoting vegetation, I could not resist the inclination which I felt to treat my readers with the following impressive expostulation from the pen of an eminent and noble British senator :

“ The science of agriculture,” says he, “ is by no means at its height ; and in the almost miraculous advance of chemistry, new means may be found from the concentration of known composts, and the discovery of new, to lessen the cost of culture, and to increase its returns. But here again your Revenue stalks like a ghost across my path, whichever way I turn ; as otherwise you have a superior unbounded source of improvement trodden under your very feet, and cast as refuse into your rivers, beyond all that chemistry is ever likely to discover. You have SALT in endless abundance, but your *necessity* turns it into *money*, even to forty times its value, instead of spreading it abroad for various uses, to rise up in property which no money could purchase.

“ After thus taxing to the very bone, this life’s blood of your people, why, to be consistent, do you not bind up by law their veins and arteries to prevent circulation ? Do you know what salt alone would do for you, if it were not seized upon as a revenue, and clung to, perhaps as a plank which you cannot quit in your distress ? I will speak of its other uses hereafter ; but can you be so ignorant as not to know, that by taking the tax upon it *directly as money*, you rob yourself of fifty times its amount in the productions of your soil ; in your fisheries and manufactures ; and in the universal prosperity of the country ?

“ Lime, which has caused to start into life the most inert and sterile parts of Great Britain, is just nothing as a manure, when compared with SALT, which differs from it besides in two remarkable qualities, decisive of its superior value.

“ Lime, and I believe all other known composts, are powerful only according to the quantities in which they are

used ; whereas salt, to be useful, must be sparingly applied ; it *corrupts* vegetable substances when mixed with them in *small* quantities, but *preserves* them when it *predominates in a mass*. It is needless therefore to add, that, independently of its comparative lightness, the expense both of the article in its carriage must be very greatly diminished. Yet you rob the mother of your people of this food which indulgent Nature has cast into her lap, sufficient, as you will see hereafter, to feed all her children, even if their numbers were doubled."

#### ON THE USE OF SALT FOR HORSES, SHEEP AND CATTLE.

On this subject volumes of evidence might be collected, but I trust that the few following extracts will be sufficient to convince the candid and unprejudiced reader.

"There is a custom in Spain and Portugal," says Sir Thomas Bernard, "which I have personally witnessed the practice of in North America, of daily placing on stones in the sheep pastures, some dry salt for the use of the sheep. I have seen each of the sheep in their turn, and with eagerness, take a small portion of it. This is considered as a preservative against the *rot*, and as contributing to their general health and good condition. In Spain the *cows* are regularly supplied with a little salt ; and the increase of their milk, and the benefit which stable-fed cattle derive from it, are confirmed by many authorities. A Cheshire gentleman informs me, that when he wants extraordinary exertion from his horses, he always gives them a little salt ; and this is analagous to the practice in the East, where the camels are allowed salt during the passage of the caravans over the Desert to Alexandria, as a support in the extreme fatigue which they undergo."—*Sir Thomas Bernard's Letter to Mr. Vansittart*, page 15.

Dr. Anderson, whose testimony will have great weight with every enlightened agriculturist, says: "There is no

substance yet known which is so much relished by the whole order of graminivorous animals, as common salt. The wild creatures of the Desert are so fond of it, that wherever they discover a bank of earth impregnated with a small portion of salt, they come to it regularly ever after to lick the saline earth. It is also admitted by all who have tried the experiment, that salt given along with the food of domestic animals (except fowls) tends very much to promote their health, and accelerate their fattening; and although some persons, who have been at a loss to account for the manner in which this stimulant could act as a nutritious substance, have affected to disregard the fact, yet no one has been able to bring the slightest show of evidence to invalidate the strong proofs which have been adduced in support of it. It is not, therefore, an extraordinary position, to say, that by a proper use of common salt, the same quantity of forage might, on many occasions, be made to go *twice as far* as it could have done in feeding animals had the salt been withheld from them. If so,—then we have here laid open to our view an easy mode of augmenting the produce of our fields to an amazing extent; for, if the same quantity of forage can be made to go, not twice as far, but one twentieth part only further than it now does, it would be the same thing as adding one twentieth part to the aggregate produce of meat for beasts throughout the whole kingdom.”

To the beneficial use of salt upon cattle in augmenting the quantity and improving the quality of their milk, and of the cheese which it produces, we have a testimony of eighteen hundred years standing:

“*Pecudes, armentaque et jumenta SALE maxime sollicitantur ad pastum, multo largiore lacte, multoque gratiore etiam in caseo dote.*”—*Plin. lib. xxxi. cap. 7.*

From a Memoir by M. Villar concerning the disorder

among the cattle at Champsaur in the province of Dauphiné, I extract the following observations :

“The mortality,” says M. Villar, “has increased in our fields since the augmentation of the price of salt has obliged the farmers to give it more sparingly to the cattle. In the district of Champsaur, and the adjacent countries, we are accustomed to give to every ox and cow four ounces of salt every eight days, and about an ounce to every sheep and goat at the same intervals. When this practice is neglected, the animals eat less ; they lose their spirits ; their hair rises ; they go licking in the stalls the bottom of the walls where the salt-petre is formed ; they grow lean, become barren, and disease ensues.”—*History of the Royal Society of Medicine at Paris*, for the years 1777 and 1778. Quarto, Paris printed 1780.

“That *sheep* are fond of salt is beyond all doubt ; it is equally certain that to these animals it is a preservative against many diseases, and if I am not greatly mistaken, contributes in no small degree to render their wool finer.”—*Landi's Description of the Ferro Islands*. London, 1810.

Pliny the naturalist, whom I have before quoted respecting the use of salt on cattle in increasing their milk, was also acquainted with the medicinal effect of salt upon the health of sheep ; for, still speaking of the uses of salt, he adds :

“*Pecorum quoque scabiem et boum illitus tollit. Daturque lingendus.*”—*Plin. lib. xxxi. cap. 9.*

“The Onondago, situated in the state of New York, is a fine lake of brackish water, surrounded by springs, from two to five hundred gallons of the water of which make a bushel of salt—all the animals of these parts have a great fondness for salt. The cattle of farmers who give this substance to their stock prove superior in value by 25 per

cent. to such as are not supplied with an article so essential not only to their general improvement, but their health. The native animals of the country, too as the buffalo, elk, deer, &c. are well known to pay periodical visits to the saline springs and lakes, bathing and washing in them, and drinking the water till they are hardly able to move from the vicinity.”—*Ashe's Travels in America*, vol. i. p. 95.

In the Memoirs of the Royal Academy of Sciences at Paris, is a Paper on the use of Salt for Cattle, an abridgment of which is published in the 24th volume of the *Annals of Agriculture*, and is as follows. It was communicated to Arthur Young, Esq. by a correspondent, in the following manner:

“In looking over the Memoirs of the Royal Academy of Sciences at Paris, I met,” says he, “with a paper entitled ‘*Physical Observations on the Effect of Salt in fattening Cattle.*’ The title excited my curiosity; and on reading the memoir, the author’s reasoning appeared to me not only plausible, but convincing. His views are certainly enlarged, and directed to objects of the most important kind, viz. the improvement of land and the increase of cattle. He lays it down as an axiom, or self-evident truth, that by increasing cattle, land may be improved; and by improving land, cattle may be multiplied.

“The farmer,” he says, “who has more than an ordinary stock of working cattle, reaps a double advantage: the one, by having his work done in season; the other, by enriching a greater portion of his land by means of their additional manure. The only difficulty is, how to maintain an increased number without increasing the expense: this, he asserts, may be done by the USE OF SALT, and advances the three following propositions:

“1. That salt given with the food of cattle, augments the nourishment of that food.—2. That in proportion to the quantity of salt eaten by cattle, the effects of that augmen-

tation will be perceivable.—3. That no ill consequence will follow from excess of salt eaten by cattle, even though it should be given them without stint. These propositions he endeavours to support by unquestionable facts.

“In the jurisdiction of Arles, in the county of Provence, there is,” he says, “a district called the Crau, extending in length about six leagues and in breadth about three, the whole surface of which is covered with small rough stones, and not a tree or bush is to be seen in the whole district, except here and there upon the borders; yet on this spot so seemingly steril, by the free use of salt, more numerous flocks of sheep are bred and reared than upon any other common of equal extent throughout the whole kingdom; and what is not less remarkable, the sheep are healthier, hardier, and endure the severity of the winter with less loss, though they have fewer sheep cots for covering, than those fed and bred on more copious pastures, and that have besides the advantage of more convenient shelter. Add to this, that the wool of the flocks bred and brought up in the Crau is not only the finest in the whole country, but bears the highest price of any in France. From hence he concludes, that it is to the unlimited use of salt that these surprising effects are to be ascribed; for it frequently happens that the Crau is so burnt up in the summer, that the poor animals are forced to turn up the very stones to come at the few blades of grass that grow round them, and yet none perish for want of food. Let every excellence, therefore, that can reasonably be supposed inherent in the herbage be allowed to it; yet the quantity of it is so small, that, without the abundant use of salt, a *fourth part* of the sheep kept in the Crau could not subsist on it.

“Having proved his first proposition incontrovertibly, he proceeds to prove the second, by recommending an easy experiment, which it is in every farmer’s power to make, and that is, to give one half of his cattle salt, and to the other half none: by this simple trial, he says, in less than

a month the difference will be discernible; the cattle to which the salt is given will show it in their looks, in the sleekness of their coats, in their growth, and in their strength and firmness of labour. He adds, that with little more than half their usual food, all these effects will be produced. To establish his third proposition, he appeals to the practice about Arles, where the cattle have as much salt as they will eat, and none are so healthy, or thrive so fast, as those that eat most of it.

“To the above observations of our correspondent,” adds Mr. Young, “we may state, that in Spain, where the finest wool in the world is produced, great quantities of salt are given to the sheep; to which they attribute, in a great measure, the *fineness* of the wool. The salt is laid upon the rocks, and the sheep who come and lick it are exceedingly fond of it.”

EXTRACTS FROM ANCIENT WRITERS ON THE EMPLOYMENT OF  
COMMON SALT IN AGRICULTURE, AND IN FEEDING CATTLE.

1. Pliny, the naturalist, seems to have known little or nothing of the use of Salt in agriculture; but he was well aware of its virtues in feeding cattle. “Herds of cattle,” says he, “being covetous of a salt pasture, give a great deal more milk, and the same is much more agreeable in the making of cheese, than where there is no such saline ground.”

*Pliny's Nat. Hist. book 21, chap. 7.*

2. John Glauber, an eminent chemist of Amsterdam, who published several esteemed works on the practice of chemistry about two hundred and fifty years ago, was so thoroughly convinced of the economy of using Salt as a manure, that he obtained a patent from the government of the United States of Holland for the sole disposal of the privilege of applying this valuable mineral to the barren lands in that country. The following brief extracts from his work, entitled “*The Prosperity of Germany*,” will be sufficient for our present purpose.

"Salts of no great cost are to be had in vast quantity, with which, corn being macerated, and sown in barren lands, and in such as are not dunged, doth come to perfect maturity : and this I have tried not only once, but oftentimes ; and have also proposed to bring it into public use in these united provinces : to which end the most Supreme Orders, general and provincial, have granted me a privilege or patent for many years ; whereby it is forbidden to sow or plant barren, sandy ground after this kind of way without my consent. The main basis of the knack lies in Sea-Salt, which may be plentifully had in these places, to fatten lean and dry ground with instead of dung."—*English Translation in folio*, London, 1689, page 388.

3. John Jonston, a learned Polish naturalist and physician, who travelled over every kingdom of Europe, and was esteemed everywhere by the learned, has an entire chapter on Common Salt, in which he writes thus : "Also fields, whereupon Salt is sprinkled, become fruitful by it, as experience makes good. It destroys worms in animals." Jonston's *History of the wonderful Things of Nature*.\* The English translation, folio, London, 1657, page 94.

4. Gervase Markham, a learned writer in the reigns of James the First and Charles the First, who was equally noted for his skill in many foreign languages, and for his knowledge of the various branches of agriculture, published a great variety of treatises on the management of land,†

\* He also published a "Natural History of Birds, Fishes, Quadrupeds," &c. in 1652, folio ; also a work upon the Hebrew and Greek Festivals, in 1660 ; and some volumes upon other subjects.

† Markham, in 1616, published "Liebault's La Maison rustique," or the Country Farm, which sometime afterwards was translated into English by Dr. Surfeit. Besides this, he printed a book entitled "Cheape and good Husbandrie ; also the Use and Profit of Bees, the manner of Fish-ponds, and the taking of all sorts of Fish." London, 1656. Another thin quarto, entitled "The Inrichment of the Weald of Kent, or a Direction for the true ordering and manuring all the Grounds within the Wealds of Kent and Sussex." London, 1660. And several other works, which were held in great estimation.



and closed his agricultural labours by the publication of a work entitled "*Markham's Farewell to Husbandry*," in which the following passages occur. "If you be neer unto any part of the sea-coast, thence fetch great store of the salt-sand, and with it cover your ground which hath beene formerly plowed and hackt, allowing unto every acre of ground threescore or fourscore full bushels of sand, which is a very good and competent proportion; and this sand, thus laid, shall be very well spread and mixed among the other broken earth. And herein is to be noted, that not any other sand but the salt is good or available for this purpose, because it is the brine and saltnesse of the same which breedeth this fertility and fruitfulness in the earth, choaking the growth of all weeds, and giving strength, vigor, and comfort, to all kind of grain or pulse, or any fruit of better nature."

"Now methinks I hear it objected, what if the ground do lye so farre within the land, that there is no salt-sand within many score miles of it, how then shall I make good my barren earth? To this I answer, that albeit this salt sea-sand be of infinite good and necessary use, inriching ground wonderfully much; but if your ground lye much within land, and farre from the sea, then to every acre of land you shall take two bushels of very dry bay-salt, and in such manner as you sow your wheat you shall sow this salt upon the ground; then immediately after the sowing of the salt you shall sow your wheat, which wheat would be thus prepared before you sow it. The day before you are to sow your grain, you shall take bay-salt and water, and mixing them together, make a brine so strong that it will bear an egge; then put the wheat you are to sow into that brine, and let it steep therein till the next day; then drain it from the brine and sow it; and no doubt but you shall find a marvellous great increase thereby. Neither is the thing itself without good and strong probability of much increase, and strength for the bettering of all manner of arable grounds;

for there is nothing which killeth weeds, quicks, and other offences of the ground, so much as saltness."

In chapter V. entitled "of the ordering of all barren clays that are over-run with ling or heath," after giving directions how to make and dress the land, he adds, "And if the ground have been sanded (with salt sea-sand) you may sow your seed-wheat simply of itself, without any doubt of the plentiful increase thereof; but if it have not been sanded, then you shall not only steep your seed in brine, but also you shall mixe your seed with bay-salt, and so sow it into the ground."

In the chapter which treats of the method of recovering such land as has been rendered sterile by the overflow of sea-water, Mr. Markham writes thus:

"In all my former relations, touching the bettering of ground, I do apply, as one of my chiefest ingredients, salt-sand, salt-weeds, salt-water, salt-brine, ashes, and many other things of salt nature, as indeed all the manures and marls whatsoever must either have a salt quality in them, or they cannot produce fruitfulness; so that it might be argued, if Salt be the occasion of fruitfulness and increase, then there cannot be much hurt done by these overflows of the salt-water, that it should rather adde a fattening and enriching to the ground, than any way to impoverish it. But experience shews us the contrary, and that there is nothing more noisome and pestilent to the earth than the *superabundance* and too great excess of saltnesse, &c."

In the chapter on enriching of barren grounds for the growth of hemp and flax, he directs first to plough it, "then with the salt sea-sand you shall sand it very plentifully, but if that be not to be gotten, and you be very well assured of the natural richness of the earth, you shall then sand it with the best red sand you can find near unto you; and upon every acre of ground you thus sand with fresh sand, you shall sow three bushels of bay-salt, and then plough up again the earth, sand and salt together, which should be

done about the latter end of the yeare, as after Michaelmas, and so let the ground rest till seed-time, at which time you shall bring sea-weeds to your hemp land, and cover it all over with the same, and then you shall plough it again, burying the weeds within the earth. As for the weeding of this ground, you shall not respect it at all, for *it will put up no weed.*"

In the chapter on vermin, Mr. Markham says. 'The next great devourers of grain are pismires or ants, which, although it be but a little creature, yet it is so laboursome, that the grain which they carry away or destroy amounteth to a great quantity. If you manure your corn lands with ashes or salt sand, you shall be well assured it will never breed pismires.'

5. Sir Hugh Platt, a writer of some eminence in the time of Oliver Cromwell, states it to be his opinion that "it is Salt which makes all seeds to flourish and grow; and that no dung which is laid on barren ground could any way enrich the same, if it were not for the salt in it." See his "*Jewell House of art and nature.*" Folio, London, 1658, chapter 104.

6. Mr. Christopher Packe, the translator of the works of John Rudolph Glauber, and an eminent chemist of the seventeenth century, speaks very decidedly of the virtues of Common Salt in agriculture. Having made some observations on Mr. Glauber's processes for mixing lime and Salt, he proceeds to give the following directions respecting the mode of applying the Salt, which are quaint enough, but I shall give them in his own words.

"The lime," says he, "must be spread upon the ground where no rain can come to it, till it slake itself by the air, and fall into a powder. Of this powder you are to take four hundred weight to one hundred weight of any Common Foul Salt, which is too impure for the use of the kitchen, where such may be had, otherwise Clean Salt (for that will be *cheaper* than dung :) the Salt and lime are to be well

mixed, and then moistened with such a quantity of water as will bring the lime and Salt mixed to the consistency of a stiff mortar. Of this mass balls are to be made about the bigness of one's fist, and laid under a shed or hovel to dry; being dried, they are to be burnt in a kiln as lime is, so that the balls may be red hot for an hour at least.\* When the balls are burnt, they are to be again placed upon a floor under a shed or hovel where they may be exposed to the air but kept free from the rain, and if you break them with a clodbeater presently, the air will the sooner act upon them, and cause them again to fall into a powder, which powder may then be carried out and spread, or rather sowed out of a *seedlet*, thicker or thinner as the land shall require; which joining itself with the earth, is again attracted by the seed when it is sown, whose growth is thereby swiftly promoted, and its multiplication much augmented."

7. The great Lord Bacon, who flourished early in the seventeenth century, having noticed the advantages which the farmers of Cornwall, Devon, and other maritime counties, derived from the free use of sea-sand, which upon those coasts chiefly consists of broken shells impregnated with salt-water. declares that the best manure next to marle is sea-sand, which no doubt (says his Lordship) obtaineth a special virtue by the salt water, and concludes by affirming that Salt is the first rudiment of life.

*Nat. Hist. Cent. 6, Exp. 596.*

8. The eminent Mr. Evelyn, in his discourse on the effects of the overflowings of the river Nile, asserts, that "Salt is the vigour and close of all things; the first and last of all elemental bodies; the *quid divinum*, and original of all fecundity."

*Philosophical Discourse of the Earth, page 103, &c.*

\* This direction for burning the mixture may have been consistent enough with the prevalent notions of the time, but the Salt would doubtless be equally efficacious without that operation.

9. The celebrated Anthony De Leuwenhoek, who was a Fellow of the Royal Society, in his observations on the storm which happened in the year 1704, when many of the banks of Holland were broken down and the country overflowed, addresses himself to his countrymen in the following manner:—"There are some," says he, "that affirm, that the scattering of this salt water by the storm will do a great deal of harm to the fruits of the earth; but, for my part, I am of a quite different opinion, for I believe that a *little* Salt spread over the surface of the earth, especially where it is heavy clay ground, does render it exceedingly fruitful; and so it would be if the sand of the sea were made use of for the same purpose."—*Philosophical Transactions*. No. 289. The year following, the Dutch had the largest crops of grass and of corn that had been known for many years before.

10. In the *Philosophical Transactions*, is a memoir by the Archbishop of Dublin on the manuring of lands in the counties of Londonderry and Donnegal, in Ireland, with sand and shells from the sea-shore, from which I extract the following passages. Treating of boggy land, he says:—"The turf is nothing but the product of vegetables, which rotting, there remains only the earthy parts: now shells being chiefly salt, the salt incorporates with the sulphur of the plants, and renders them fit for the vegetation of new plants, which further appears from this, viz.—that those shells which have been under the salt-water are much better than such as lie dry on the strands. Some thousands of acres have been improved by these shells, and what formerly was not worth a great per acre is now worth four shillings. Some years ago they made lime of the shells, and manured their lands with it, but a poor man, who, from laziness or poverty, had not provided to make lime, threw the shells unburnt on his land, and his crop proved as good as his neighbours, and the second and third crop better; and all took the hint, and have used them so ever since.

Where shells are not to be procured, sea-wrack or sea-sand supply the want.”—*Philosophical Trans. No. 314.*

11. Soon after the formation of the Royal Society, Dr. Bury delivered a memoir, containing an account of the manuring of land in Devonshire with sea-sand, which is much to our purpose. “Salt,” says he, “quickeneth dead land, and is used in the south-west part of that county, which would otherwise be the barrenest, but is now the richest part thereof. The inhabitants go as far as the sea will permit them at lowest ebb, take the sand in bags, and carry it on horseback fourteen miles into the country, and spread it on the land, thereby improving it both for corn and grass. Crude Salt alone, if strewed upon the ground, does not improve but corrode it; the Sea-Salt is too strong and active of itself unless mixed with lime—how to mix them, Glauber directs.”—*Philosophical Trans. No. 316.*

12. Dr. Cox, in his memoir, printed in the *Philosophical Transactions*, on the manuring land with sea-sand, writes thus: “The effect it usually produces where much of this sand is used, is, that the seed is much and the straw little. I have seen,” says he, “in such a place good barley, where the ear has been equal in length with the straw it grew on. After the corn is cut, the grass, though it be but short, yet as to feeding, giving good creams, plenty of milk, and all other good purposes, far exceeding the longer grass, where less sand is used.”

*Philosophical Trans. abridged, vol. ii. page 730.*

13. Dr. Plott, the author of the topographical histories of Staffordshire, Oxfordshire, &c. when treating of the husbandry of his own time, says:—“At Nantwich they yearly brine their fields, from which they find a more profitable return than from any soil or dung.”

*Nat. Hist. folio, page 39.*

EXTRACTS FROM MORE MODERN WRITERS ON THE USE OF  
SALT IN AGRICULTURE.

14. "I am well assured from a Scotch gentleman, that they have long used Salt in that part of Great Britain, always sowing ten or twelve bushels by hand of their coarse Salt on an acre of young green wheat, sometime in November, December, January, or February, it being, from the several accounts which I have had of it, very effectual in the *killing of tender weeds* amongst corn, yet at the same time *cherishing the corn*; and though it does not add altogether to the bulk or height of the straw, yet it does much to the goodness and plumpness of the grain. And whoever has been curious in their remarks abroad will find that it is the usual practice of the Milanese to sow Salt on their pastures, as I have been informed by one who has sold great quantities for that purpose; as also by a merchant of Liverpool, who is well acquainted with that trade, who affirms that the finest crops they have of hemp and flax amongst the Dantzickers and others, who raise those commodities in those countries, are from lands on which Salt is strewed."—*The Practical Husbandman*, Octavo, London, 1733, vol. i. page 48.

15. "Salt certainly sweetens the grass much; and it may on all such occasions be mixed with a proper quantity of dung, which is more sulphureous than Salt, and will make grass shoot away much faster than any other manure. Lime in its own nature makes grass *sour*, but when mixed with Salt, that acidity will be taken away."—*Practical Husbandman*, vol. i. page 57.

16. "As to the proportion of Salt to be used on land, it ought to be according to the nature of it; cold, wet, clayey land requiring more, and loose soft land, though it be poor, requiring less. Again, the proportion of Salt ought to be either more or less, according to the crops of grass or grain

you would improve. For cold, wet, and spewy land, ten loads of dung, six of earth, and eight bushels of Salt, per acre.

“For lean, hungry, sandy land, fourteen loads of pond-earth, six loads of dung, and six bushels of Salt per acre when employed for corn and grazing.

“For meadow land, fourteen or fifteen loads of dung, five bushels of Salt, and four of pond-earth, the quantity of each to be altered according to the quality of the ground.”

—*Practical Husbandman*, London, 1738, page 59.

17. “Thus have I made out what I proposed, viz.: that every acre of land in England which was to be improved, may be done ten or twelve shillings an acre cheaper by Salt than any other way. Suppose then, that out of the forty millions of acres of land which are calculated to be in England and Wales, there is but one-eighth part, which is five millions, to be improved every year; and that one-half of those five millions may be manured by some other manure, there yet remains two millions and a half to be done by Salt still; which, reckoning the savings at ten shillings per acre only, (the expenses being about the same) comes to one million two hundred and fifty thousand pounds; which, if the old proverb be true, that so much saved is so much earned, then that sum is a real addition to the landed interest of Britain; and this calculation is not at all disagreeable to what is affirmed by some Cornish and Devonshire men, when they say that the money laid out in salt sea-sand, for the improvement of lands in those two counties, comes to thirty-two thousand pounds per annum.”

—*Practical Husbandman*, vol. i. page 63.

18. “On watering meadows with a solution of Salt, we are directed to make a large pit about twenty or thirty feet square, and five or six feet deep, more or less, as there will be occasion, in the method tan or salt pits are made, and put therein ten or twelve bushels of salt, and as much of lime, soot, or any other ingredient of that kind, and, having a pump near at hand, or some conduit or spring of wa-



ter, fill the pit up by degrees, at first to three or four feet high, letting the ingredients dissolve in the water, by being there twenty-four hours at least, stirring them sometimes about, and after that, by dipping in of the finger it will be found whether the water is salt enough (as near as you can to the strength of sea-water :) if it is not sufficient, then may be added a reasonable quantity more of the above mentioned materials ; but if it be too salt, then more water may be poured in till it is just right and fit for use ; and being possessed of a moving pump or a skip, pump the water into a hogshead, with a leather pipe, and a watering rose at the end of it, just as is practised in watering the streets in London, and so (having the hogshead placed on a roll) may both meadows and corn land be watered to a good advantage.”—*Practical Husbandman*, vol. i. page 74.

19. “To shew an acquaintance of mine the effects and advantage of Salt properly applied to vegetables, I made the following experiment, in an extreme dry summer, upon a bare piece of pasture land, out of which the cattle were all taken for want of grass: I marked four places with stakes, each of which I watered nine nights successively, in the following manner:—the first with spring water alone, to the quantity of a gallon; the second with the same quantity of water, adding an ounce of common salt; the third and fourth with the same quantity, mixing the water in the third place with two ounces of salt; and that in the fourth with three ounces, which produced the following different effects.

The grass in the second place grew more and of a darker green than that in the first; in the third, it only grew by spots, for part of it was killed where the greatest quantity of water fell, and the fourth was quite brown for a greater compass than the third; by which it appeared that an ounce of salt in a gallon of water had a better effect than the water had alone; and that three ounces of Salt, mixed with a gallon of water, was more than the grass could im-

mediately receive; but the fourth place in the ensuing spring was the most fertile of them all.”—*Treatise of Fruit Trees*, by Thos. Hitt, 8vo. Third Edition, London, 1768, page 17.

20 “Soils which are subject to the grub, and must be fertilized by common dung, which is a proper nest for the mother beetle to deposit its eggs, must be well impregnated with the brine of dissolved salt, after the dung is first cut up: two large hogsheads of salt will make brine enough for a dung pan of fifty feet square. This cure for the grub is a late discovery, for which I am obliged to a judicious planter, and which I have tried with success.”—*From an Essay on Plantership by Samuel Martin, Esq. of Antigua*.

21. “Having tried Salt upon a small scale on a sandy soil, I can assert sixteen bushels to be a proper quantity for one acre. It gradually advanced in its effects to sixteen, and as gradually diminished to forty bushels when vegetation was destroyed. Twice only have I had an opportunity of buying a few tons of foul Salt, and used it both times on a barley tilth, sowing the Salt immediately after the barley. The event was perfectly satisfactory. The verdure of the spring exceeded any thing of the kind I ever saw; and the ripened appearance was whiter by many shades than I ever beheld. N. B. Salt is noxious both to weeds and vermin.”—R. Legrand, Esq. *on Manures, in the Annals of Agriculture*, vol. v. page 149.

22. Some Extracts from a Pamphlet entitled “Hints to Country Gentlemen and Farmers, on the importance of using Salt as a general Manure.” By the late John Hollinshead, Esq. of Chorley. 3rd edition, 1802.

“Salt,” says Mr. Hollinshead, “will be found to be the cheapest, best, and most durable manure ever yet made use of: and for the readier distribution of this most excellent manure through the kingdom, the public and enterprising spirit of the nation has of late years provided very ample and cheap conveyances to almost any part of the country

which the gentleman and farmer can wish, by means of the numerous navigable canals, which are either finished or projecting in almost every direction. Salt may be laid on the banks of the *Staffordshire* canal at fourteen shillings per ton: from whence, by means of the *Oxfordshire Grand Junction*, and other canals, it will with the greatest ease be conveyed to any part of the south of England, at a very trifling additional expense.

“Suppose a farmer to live twelve or fifteen miles distance from any canal, navigable river, or part of the sea-coast (which in general, perhaps, will be found to be the greatest extent he can have to fetch it,) from whence he can import Salt for the benefit of his lands; even at that distance his team will fetch a load of Salt in one day, say at the expense of ten shillings; and with that team he will convey home one ton of salt; therefore, for fourteen shillings, the original price of the Salt, five shillings (more or less) for the freight by the canal, river, &c. and ten shillings for the carriage home, he lays in his own field manure sufficient for two acres and a half of land, at the small expense of one pound nine shillings. What a vast superiority in point of expense, this would have over all the manures now in use; for lime, dung, or marle, even where most plentiful, on account of their great bulk, cost more in the single article of cartage, without regard to the expense of buying, or digging for them, than the whole charge of salt when laid on the ground.\* Besides, as so *small* a quantity of Salt in weight will serve for manuring lands, this is no inconsiderable recommendation, because on that account it may with ease be conveyed to the *most rough, steep, and mountainous* parts of the country, to which the bulky and heavy manures now in use could not be carried,

\* This goes on the presumption of Waste Salt being allowed the farmer duty free; but even with the present duty, a ton of Rock Salt, containing forty bushels, may be put on board a boat on the canal for six pounds.—S. P.

but with infinite labour, and at an expense far exceeding all the advantages to be expected from it."

23. "That Common Salt is an excellent manure, experience, the most satisfactory of all evidences, clearly proves. It was used round Northwich, in Cheshire, as a manure, so long as foul Salt was permitted duty free, with very great success."

24. "Nothing in nature is so powerful as Salt, to meliorate and drain strong and stiff soils, and also to give moisture to dry ground: it is also a certain destruction to weeds and insects. Besides its efficacy on corn and fallow grounds, its excellent qualities in giving luxuriance and salubrity to grass lands are peculiarly worthy the attention of the grazier and breeder of cattle."

25. "When a farmer intends to fallow a piece of ground, he ought first to sow it with such a quantity of Salt as would be sufficient to *destroy* all vegetation, viz. forty bushels per acre;\* which, by cutting and dividing the viscous substances which are in the earth, would reduce it into a proper state to become food for plants. The farmer must take notice, that this Salt is to be sown on the ground sometime before he begins to work his fallows with the plough (the autumn will be the most proper season,) in order to give the Salt sufficient time to destroy the grass and other roots upon it, before he begins to work it. The Salt being thoroughly mixed and incorporated with the soil, during the spring and summer following, whilst the land is on the plough, will, by the time the seed is sown upon it, be reduced to that strength which is the most proper for effectually and vigorously assisting and supporting vegetation while the seed is on the ground, and such lands will be

\* I think it necessary to remark upon these directions, that I believe the writer is here, and in the former extracts, speaking of *foul* Cheshire Salt, such as at that time was allowed to be used for land. Therefore in using Rock Salt only half the quantities which he mentions ought to be employed.—S. P.

found to produce a crop superior to those under any other mode of cultivation.

“This method of sowing the intended fallows with Salt will, therefore, serve very much to lessen the labour of the husbandman in working his grounds; for the tough and adhesive clods and lumps which are generally so troublesome, especially upon clayey soils, will be so completely broken and dissolved by the operation of the Salt, as to give much less obstruction to the harrow at the first working.

“In deep, loamy, dry earth, upon which wheat has grown, after the crop is got in, the land should be ploughed, and lie in that state until the spring, when it must be cross-ploughed and wrought fine with the harrow, and planted with potatoes: as soon as the potatoes are covered with earth, then sow or spread sixteen bushels of Salt per statute acre upon them; and when they are dug up in the autumn, then sow a crop of wheat again, taking care to pick all the potatoes clean out, that they may not injure the wheat in the following spring by growing up amongst it. By this method of cultivation, a crop of wheat, and another of potatoes, may be produced alternately on the same ground *for ever*, instead of losing a whole year's produce, according to the old custom, whilst the land is in fallowing.

“For other corn lands sown in the usual way, after a spring ploughing, the best method will be to sow sixteen bushels of Salt per acre, immediately after the grain is covered in by the harrow; this, by meliorating the soil, destroying weeds and insects, and attracting moisture, will produce an abundant crop; and, by sowing ten bushels per acre *annually*, these lands will ever after be exceedingly productive.

“There is still a further advantage which is highly worthy the farmer's attention, which is, that by having constantly a plentiful supply of such a cheap manure, he can always keep his grounds in a condition fit to receive any kind of grain which he would wish to sow upon it, which at pre-

sent is far from being the case: for instance, if he now wishes to sow a crop of wheat, he cannot do it without lime or marle; if he would plant potatoes, it cannot be done without a large quantity of dung, which, if it is of his own producing, he will impoverish his other lands while he enriches this: if he buy it, it must be at an enormous expense, and also to the proportionate injury of the district from whence he procures it, where it ought to have been expended; and therefore, though it should enrich an individual, it will not be of the least advantage in a public point of view, which undoubtedly ought principally to be attended to in things of this nature. Also, when a person enters on a poor farm, unless he be possessed of a larger capital than usually falls to the lot of this useful class of mankind, with all the industry and management of which he is master, his lease, nay even his life, may be expired before he has manured one-half of his estate, and generally speaking, the parts which he first tilled will be reduced to their former poverty, before one-fourth of the farm has received any benefit.

“ But if he were permitted the use of Salt, duty free, with a very moderate sum of money, he would have it in his power, in a few years, to bring his farm into the highest state of culture and fertilization; so that at all times he would be enabled to bring to market those articles, which his situation, or the particular necessity of his neighbours, pointed out as most beneficial to himself.

“ Another considerable advantage would arise to the occupiers of small farms in particular, and especially those with large families, from manuring with Salt, as they would be enabled to raise, not only a much greater *quantity*, but also a much greater *variety*, of the common necessities of life, from the same extent of ground. For example:—a man who rents a few closes of land, gets, perhaps, nothing but milk and butter from his little farm, whilst he has the most substantial part of the sustenance for his family (bread) to

buy, generally at a high price. But give him Salt duty free, and he may pitch upon *one* field, which, with the assistance of this manure, will produce him abundant crops of grain annually for ever, whilst his other fields will remain unmolested, and, if also salted, covered with the most luxuriant and wholesome herbage for the use of his cattle. At present, if he ploughs at all, it must be in rotation, or, as the farmers term it, in *shifts*; and by that means he is constantly injuring his grass-lands.

“When salt is used upon pasture-lands, it may either be sown upon them in its simple neat state, after the rate of sixteen bushels\* the acre, or mixed with compost, mud, or loamy earth; sixteen bushels of Salt to twenty loads of earth, and turned in the heap two or three times to incorporate it properly; this compost should be laid on and spread in the autumn.”

26. “For meadow-lands we would advise the farmer to sow *six* bushels of Salt per acre, immediately after the hay is got in. This would be found peculiarly beneficial in hot and dry summers, and upon lime-stone and sandy soils; which, after they are mown, are often so much parched by the heat of the sun, that not only the eddish is destroyed, but also the crop of the ensuing year is very materially injured; but by sowing it with Salt, moisture would be attracted and retained, sufficient to assist vegetation so powerfully, as in a short time again to cover the face of the ground with grass, and by that means effectually to screen the roots, which would otherwise be too much exposed to the direct rays of the sun.

“It may, indeed, be said, that dung will answer the same purpose: in some degree it might, but dung cannot always be had, never in sufficient quantities: besides, if it could,

\* I think it necessary again to caution the farmer against using this quantity of *pure* salt upon grass-land, as it would probably burn up the grass. The writer speaks all along of *foul* waste Salt, from the Salt Works, which was seldom more than one-third of it real Salt.—S. P.

this objection lies against it, that neat cattle will not eat the eddish after dung, consequently one valuable crop is lost to the farmer, which, if Salt were used, would be both productive and wholesome. Also, the hay, when put into the mow or stack, should be sprinkled with Salt on every ayer. When hay is housed soft, this should never be omitted, as it would prevent what the farmers call the *mow-burn*, and make the hay far more pleasant and nutritious for the cattle in winter."

27. "Mr. Beck, gardener in Chorley, has constantly made use of Salt in his garden for upwards of thirty years, principally upon his onions; and he has invariably found the Salt to exceed every other kind of manure which he could have used for the like purpose. His method is to sow the Salt immediately after the seed is covered in. But as he never had any thought of communicating his observations and experiments to the public, he took no care to ascertain the exact quantity necessary to be sown on an acre, and proportionably upon any smaller quantity of ground: yet he thinks, if he might hazard a conjecture, that he has not sown *less*, and probably *more*, (of waste Salt) than *sixteen* bushels per acre. One year, by way of trial, he sowed the usual quantity of Salt upon a plot of onions, *after* they had begun to shew themselves above ground, and the crop, so far from being improved, was entirely spoiled; from this he infers, that the experimental gardener, who may be inclined to make use of Salt, will do well to throw it on as soon as possible after the seed is sown."

28. "The only manure that can be procured in all places is dung (lime and marl being entirely local, and confined to certain districts;) and how insufficient it is to answer all the purposes of husbandry, need not here be insisted upon, since it must be plain to the most superficial observer. Let us turn our eyes for a moment to the generality of breeding and grazing-farms, and see in what state



they are. The dung that can be raised from the produce of the farm is all expended upon a few acres of meadowland, whilst the pasture-grounds are destitute of every kind of improvement. This is no idle speculation; for which way so ever we turn our observation, we shall find abundant proofs of the truth of the assertion—thousands and ten thousands of acres lying in the same state, with regard to any actual improvement that has been made in them, in which they came out of the Creator's hands, and must inevitably remain so, unless some other manures are introduced into practice, besides those which are now in use.

“What a misfortune to the dairy must this neglect of the pasture-grounds be! and this too is the ground upon which the occupier must principally rely; for it is well known, that during the summer months, whilst his cows are at grass, is the time in which he chiefly produces his butter and cheese; and yet this ground is entirely neglected. Whilst the demand for those articles is daily increasing, we are indifferent whether their productiveness be proportioned to that demand; by which inattention the price of those commodities has, in a few years, been doubled. And what shall bring them to their former price? *Manure these pastures with salt.* By this means we shall increase their produce two-fold, and consequently decrease the price of those necessaries of life nearly in an equal proportion. This would be an unspeakable advantage and comfort to the labouring poor, at the same time that it was enriching both the farmer and land-owner.

“I know some will say that there are many soils which cannot be improved. I deny the assertion. Let but the farmer be properly encouraged to make the trial, and I am convinced he will not find his labour lost. If our ancestors had always been indifferent to agricultural improvements, what must have been our situation at the present day? We might have lived upon the haws and berries of the field; for nature has not been so lavish in her gifts to

this country as to some others : few of the necessities of life will thrive and flourish without the most unremitting industry. *By nature our apples are crabs, and our plumbs sloes!* but art and nature have changed the scene : and health giving exercise, properly directed, and duly encouraged, would bring the kingdom to an unexampled pitch of plenty and splendour.

“The proper cultivation of the soil is an object so peculiarly interesting to the community at large, that those who industriously attend to it are perhaps to be esteemed the most meritorious citizens of their country.

“Of such importance are the study and practice of agriculture in Scotland, that they have instituted a professorship in one of their universities ; and it is much to be lamented that a similar institution is not introduced into our universities, as it would essentially tend to the promotion of this most important department of knowledge, so highly beneficial to mankind.”

29. “It is proved by the general returns of the number of inhabitants in *England and Wales*, that there has been an increase of two millions (or nearly one-fourth of the whole) during the last century. Then, as population and manufactures are rapidly increasing, is it not of the utmost consequence that we should have a proportionate increase in the productions of the earth ?

“With proper encouragement to and management in agriculture, I have no hesitation in affirming that the generality of land, in most parts of England, might be made to produce double crops in a very little time ; and with the addition of salt as a manure, instead of importing corn from abroad, to the great disadvantage of the nation, we might make our own produce not only sufficient for home consumption, but also to supply the wants of our neighbours. I need not insist on the advantage to be derived from such an improvement, not only to the farmers, but to the public at large, for it is well known to every commercial man of

what importance it is that our merchants should always have it in their power to undersell their rivals in foreign markets: this, however, it will be impossible for them to do, even if there be no advance in the price of the raw material, unless by bringing down the price of provisions we proportionably keep down the price of labour. And no other mode can be adopted so likely to accomplish this most desirable end as the general use of Salt for manure.

“We shall just mention one thing more in support of what has been advanced respecting the benefits of Salt for manure, which falls within every farmer’s notice, but which, probably, has not struck him in that light in which we are about to represent it. Cattle kept in a straw-yard, without any thing but straw for their sustenance, yield a poor light manure, little superior to natural soil; whilst cows or oxen feeding on good hay, assisted by corn, oil-cakes, or other invigorating food, produce manure of the best kind; thus the stronger the manures are impregnated with Salts, of more value they are.”

30. “We have at least *seven millions* of acres of uncultivated land in this kingdom! What a loss to the community must this be! Here is ground sufficient, if properly cultivated, to furnish all the inhabitants of the country with bread, lying entirely waste, whilst they are paying a double price for the necessaries of life! Let us not neglect the advantages which providence has so kindly put in our power: the means of relief are within our reach, if we are not wanting to ourselves. If half the money that was necessarily and humanely spent during the late scarcity, in bounties on the importation of grain, had been laid out in inclosing waste lands, and giving premiums to farmers, I am convinced that in any future unfavourable season we should not be obliged to rely upon a scanty and precarious supply of grain from other countries, but on our own granaries at home, which have been well stored in a time of plenty by the wholesome produce of our native soil.

“If we turn our eyes to the empire of *China*, we shall there see the beneficial effects of a due attention to agriculture. The population, upon an average throughout that vast empire, amounts to the surprising number of three hundred inhabitants to every square mile; that is, nearly three times the population of this country; and yet these people are maintained in plenty, without any assistance from other nations. How this is accomplished, SIR GEORGE STAUNTON, in his elegant and authentic account of LORD MACARTNEY’S embassy to *China*, informs us. ‘The whole surface of the empire,’ says he, ‘is, with trifling exceptions, dedicated to the production of food for man alone. Few parks and pleasure-grounds are seen except those belonging to the emperor. Little land is taken up with roads, the chief communication being by water. There are no commons or lands suffered to lie waste through neglect, or the caprice or for the sport of great proprietors. No arable land lies fallow. And whatever defects there are in the soil, it is supplied by mixture with other earths, by manure, by watering, and by careful and useful industry of every kind.’ Let us copy after so useful an example.

“The present high price of Salt, encumbered as it is with heavy duties, is such as to prevent all attempts of the farmer to ascertain its real utility by experiments. In order to do away this inconvenience, we sincerely hope the legislature will take this matter into its further consideration, and repeal the duty upon Salt, as the only thing that can effectually promote the proper improvement of the country.

“The Salt Rock in Cheshire lies about thirty-six yards below the surface, in thickness from ten to forty yards; it extends twelve miles in length, and several miles in breadth: and throughout the whole district springs arise, which are made into Salt. This rock, together with those which are in Worcestershire, &c. are sufficient to supply the whole kingdom *for ever*, without any fear of their being exhausted; and, if properly applied, are a treasure far greater than the gold mines of Mexico and Peru.”

31. "The following account we had from Mr. Thomas Sutton, of Middlewich, in Cheshire. 'About twelve years since I dug up,' says he, 'a quantity of earth out of a field where a new building was going to be erected, in which there was some appearance of Salt-springs, the water from which had oozed up through the soil, and left an incrustation composed of the particles of Salt upon the surface of the ground. This soil, together with the Salt contained in it, I mixed with horse-dung: after it had lain some time in the heap, I spread it upon a piece of meadow-ground, which has been mown ever since, without any other manure having been laid upon it; and the other part of the meadow has been manured in the usual way every second year, and yet is now in no better condition than that which was covered with the Salt and dung twelve years ago.'—*Mr. Hollinshead's Hints to Gentlemen, &c.* Page 5—33.

32. "A farmer at Glasson, near Lancaster, has for some time been in the habit of carting Salt-water to put upon his dung whilst in the heap in the yard, before it was taken to be spread upon the ground, which he has found by experience very much enriches the dung, and makes it better manure. A great advantage might also be derived to the farmer from spreading sea-sand under and amongst the dung, whilst it is in collecting, during the winter, and also in the cow-house, stable, and yard, not only on account of the particles of the Salt contained in it, but likewise by its retaining and absorbing the urine of the cattle, which is itself a very excellent manure."

"A farmer in the county of Sussex, some years ago, had a field, one part of which was very wet and rushy, and the grass produced upon it was of so sour and unpleasant a kind, that the cattle would not graze upon it: he tried several methods to improve it, but to little purpose; at last, having heard of the benefits of Salt as a manure, he determined to try that; for which purpose he procured a quantity of Rock Salt, which in a random way, without any

regard to the precise quantity, he threw upon this rushy ground, fencing it off from the other part of the field; the first effect of which was a total disappearance of every kind of vegetation. In a short time after, however, it produced the largest quantity of mushrooms ever seen upon an equal space of ground in that county. These in the spring following were succeeded by a most plentiful and luxuriant crop of grass, far exceeding the other part of the field in the richness of its verdure and the quickness of its growth: the cattle were remarkably fond of it; and though the Salt was laid on it *upwards of twenty years ago*, this part is still far superior to the rest of the field.”—*Appendix to Mr. Hollinshead's pamphlet*, page 33—35.

33. Mr. Wedge, in his agricultural survey of the county of Chester, says, “foul Salt is a most excellent manure, either for pasture lands or fallows: and it is much to be regretted that so large a quantity as seven or eight hundred tons should annually, in Cheshire alone, be lost to the community. The heavy duty laid upon refuse or dirtied Salt prevents its use for manure.

“A difference of opinion,” continues he, “having been entertained as to the utility of Salt as a manure, we insert the following experiment, which we have been favoured with by a gentleman of Northwich: In a meadow, where the after-grass being of a coarse, rank nature, which the cattle refused to eat, Salt was laid upon a part of the meadow, and the cattle have ever since preferred the grass growing on that ground to every other part of the field, and eaten up every blade. He also states that the good effects of Salt are particularly seen by mixing it even with the coarsest manure, and then laying it upon the land.”

34. The late Thomas Buterworth Bayley, Esq. who was a Fellow of the Royal Society, and honorary member of the honourable Board of Agriculture in London, in his “Thoughts on Manures,” after enumerating nineteen different substances which improve land, adds, “There is ano-

ther source of improvement LOST TO THE COUNTRY, but *not through the fault of the farmers*, viz. refuse rock-salt, and refuse liquor from the salt-works. I trust the very impolitic restriction which forbids the use of this valuable manure, and causes its *total loss*, will soon be removed by the exertions of this Society and those of the Honourable Board of Agriculture.”—*From an Address read to the Members of the Agricultural Society of Manchester, October 22, 1795.*

35. “Salt is the mother of all manures, as every kind of manure is higher or lower in value according to the Salt it produces; and every kind of manure is portioned out to the land according to the quantity of Salt or nitre it is thought to have in it. Formerly, Salt was thought to be an impoverisher of land, but experience has taught us wisdom: it is now found to be otherwise, provided it is duly proportioned to the state the land is in, and mixed to mollify it as follows: take ten bushels of Salt, and six bushels of dry ashes, and mix all together; then spread them on the land, and harrow them in with the seed: this is a sufficient dressing for an English acre, as it is better to repeat the dressing than to lay too much on at once. By being thus mixed, one particle incorporates and mollifies the other. Salt itself is rather too severe and harsh in its nature, and if laid too thick on, might prove of bad consequence; but if conveyed into the earth by a soapy, smooth method, will prove the real enricher the earth wants to send forth vegetation: this dressing will last for three crops. Sea-weeds, shells, fish, sea-water, sea-sand, have in them a proportion of salts, and, therefore, must be esteemed a manure.”—*From C. Varley, Esq. communicated to the Chester Chronicle by the Rev. B. Dacre of Mosely, near Manchester.*

36. “After draining a piece of sour rushy ground, about the middle of October, some refuse Salt was spread upon a part of the land, after the rate of eight bushels to the acre, and in another part sixteen bushels. In a short time the vegetation disappeared totally; and during the month

of April following, not a blade of grass was to be seen. In the latter end of the month of May, a most flourishing crop of rich grass made its appearance on that part where the eight bushels had been laid. In the month of July, the other portion produced a still stronger crop; the cattle were remarkably fond of it, and during the whole ensuing winter, (which is ten or twelve years since) and to this day, the land retained, and yet exhibits, a superior verdure to the neighbouring closes.

“A gentleman lately carried a small quantity of couch-grass roots and other rubbish harrowed off his land, to the Salt Works, and laid it for some time upon the ground, where the foul Salt, by the direction of the officer, is destroyed; he then carried it back, and mixed it with other manure. His barley and his hay-grass were strong from this composition, beyond his most sanguine expectations.

“Its effects on fallow-land are equally advantageous. By sowing it at the time of breaking up the lands for a fallow, its strong saline quality destroys vegetation and every noxious insect; but by being mixed sufficiently with the soil before the wheat is sown, it adds a strong nutriment, and ensures the best of crops.”—Dr. Holland’s *Agricultural Survey of the County of Cheshire*.

37. The following impressive expostulation is said to be from the pen of the Right Honourable Lord Erskine.

“The science of agriculture is by no means at its height; and in the almost miraculous advance of chemistry, new means may be found from the concentration of known composts, and the discovery of new, to lessen the cost of culture, and to increase its returns. But here again your revenue stalks like a ghost across my path, whichever way I turn; as otherwise you have a superior unbounded source of improvement trodden under your very feet, and cast as refuse into your rivers, beyond all that chemistry is ever likely to discover. You have SALT in endless abundance, but your necessity turns it into money, even to forty times



its value, instead of spreading it abroad for various uses, to rise up in property which no money could purchase.

“Do you know what salt alone would do for you? Can you be so ignorant as not to know, that by taking the tax upon it *directly as money*, you rob yourself of fifty times its amount in the production of your soil; in your fisheries and manufactures, and in the universal prosperity of the country?

“Lime, which has caused to start into life the most inert and steril parts of Great Britain, is just nothing as a manure. when compared with SALT, which differs from it besides in two remarkable qualities, decisive of its superior value.

“Lime, and I believe all other known composts, are powerful only according to the quantities in which they are used; whereas Salt to be useful must be sparingly applied; it *corrupts* vegetable substances when mixed with them in *small* quantities, but *preserves* them when it *predominates in a mass*. It is needless therefore, to add, that, independently of its comparative lightness, the expense both of the article and its carriage must be very greatly diminished. Yet you rob the mother of your people of this food which indulgent nature has cast into her lap, sufficient, as you will see hereafter, to feed all her children, even if their numbers were doubled.”—*Armata*, part 1. page 169.

38. “Salt answers best as a manure for green crops, especially for turnips and clover. It is not of much benefit to barley or wheat, if sown; but in compost it proves very advantageous; using thirty Cornish or forty-five Winchester bushels per Cornish acre, which is larger than the statute acre, nearly in the ratio of six to five. Prepare the ground for turnips, and sow the Salt a fortnight before the seed, or longer, if a larger quantity of Salt is used.”

Mr. Seckler, at Henver, in the parish of Gwinear, has just applied Salt in the above proportion to poor exhausted land; being clay, inimical to turnips: the effect has been a heavy, rich crop, which I have had an opportunity of

seeing. It is such a one as a hundred tons of dung per acre would scarcely produce in the same land. The Salt employed is that which is considered refuse, after having cured the fish, and been condemned by the excise. Over this they throw some dirt, and it is then sold to the farmers by the fish-curers. If the duty were taken off Salt, for every bushel now used there would be at least a hundred bushels employed for this purpose. It has been said that the value of refuse Salt, as a manure, depends upon the soil and animal matter which adheres to it; but the farmer knows from experience, that that Salt is to be preferred which has cured only one bulk of fish; and they give a higher price for it than for that which has been twice employed, and which consequently contains more animal matter. Where an estate has been salted for two or three crops, the effects are visible for at least seven years. It has a particular tendency to convert poor and light soils into firm and adhesive ones, 'giving them body.' Among the farmers there is a general scramble for the refuse Salt, to try who can get most of it by purchase.

"The following curious anecdote may be related as serving to illustrate the effect of Salt: Mr. Seckler made a little heap of earth in the midst of a field, on the top of which a cart load of refuse Salt was thrown; the earth in the heap itself, and (after its removal) the earth under it, for upwards of two feet deep to the clay, was rendered so perfectly barren, that the most common weeds would not vegetate in it. This barren earth, however, furnished the richest dressing for the remainder of the field. Mr. Seckler found Salt the best preservative against the mildew in wheat. When the wheat followed turnips with Salt, it escaped the mildew which attacked other fields which were not salted; and this he finds to hold universally good, as far as his experience goes. The improvement of bad hay, by Salt applied in the proportion of about one hundred

weight\* to three tons, and sprinkled between the layers, is very striking, preventing mildew, and rendering it more grateful and beneficial to cattle, especially if the hay is bad : and even in good hay it is very greatly ameliorated. A testimony in favour of the benefit of Salt is furnished by the striking fertility of the land in the neighbourhood of the sea-shore in Cornwall ; more especially in those situations which are favourable to the general distribution of the saline spray, as is exemplified in the parish of Fennor.”—Sir Thomas Bernard’s *Case of the Salt Duties*, page 272, communicated by Dr. Paris, late of Penzance, but now of Dover Street, London.

39. “Notwithstanding the excessive duty, numerous experiments have been made, and almost invariably with uniform success. An interesting detail from the Rev. E. Cartwright will be found in the fourth volume of communications to the Board of Agriculture, which is conclusive, as to the application of Salt as a manure for potatoes. It appears from this communication, that the experiment could not have been tried on a soil better adapted to give impartial results. Of ten different manures which were resorted to, most of them of known and acknowledged efficacy, one only excepted, *Salt* was superior to them all. Its effects, when combined with soot, were extraordinary, yielding in a row two hundred and forty potatoes, whilst one hundred and fifty only were produced from the row manured with lime. It was observable also, where Salt was applied, whether by itself or in combination, the roots were free from that scabbiness which often infects potatoes, and from which none of the other beds (and there were in the field near forty more than made part of the experiments) were altogether exempt. And in Dr. Holland’s Agricultural Survey of the county of Chester are clearly

\* This is foul fishery Salt : of pure Salt, a third of the quantity might be sufficient

shewn the good effects resulting from its use on grass lands, and as a manure for wheat and barley. In the twenty-seventh volume of the Annals of Agriculture, there is a communication from Davies Giddy, Esq. of some interesting experiments on the use of Salt in the culture of turnips; by which it appears, that on a part of a field, which had been previously exhausted, half a crop of turnips was produced: but the crop totally failed in that part of the field where the ordinary manure was laid *without* Salt. In another instance, three acres of land, which in the preceding year had borne a crop of wheat, not exceeding twelve bushels on an acre, were ploughed before Christmas, and brought into fine tilth by the Midsummer following. On each acre were sown twenty bushels of Salt, excepting that two ridges towards the middle of the field were purposely left without it: on these two ridges the turnips totally failed; but the remainder of the field produced a plentiful crop. It is farther instanced, that four acres of land, completely worn out by successive tillage, were ploughed before Christmas; three acres were sown with Salt, at the rate of twenty-five bushels, and the remaining acre with eighteen bushels, without any other manure: the crop was in general a good one, but was visibly the best where the greatest quantity of Salt had been used. Crops of turnips were subsequently raised with equal success; and in the severe winter of 1794-5, it was much less injured by the frost than others similarly treated and cultivated in the common way.”—*Letter to the Right Hon. Nicholas Vansittart, by William Horne, Esq.*

40. “Sea-sand is very generally used in the county of Cornwall for manure, and the quantity which is every season carried away from different parts of the coast for the purpose of manure almost exceeds belief. From Bude, in the parish of Stratton, it has been ascertained that in one day as many as four thousand horse-loads have been taken; and from the harbour of Padstow, it has been computed,

that fifty-four thousand cart-loads are annually carried. The expense of land-carriage for sand, used in the county, has been considered as amounting at least to thirty thousand pounds annually."

"That the beneficial operation of this sand depends upon the presence of calcareous matter there cannot be any doubt, but, at the same time, we are borne out by unequivocal facts, in believing that the Sea-salt, with which it is impregnated, contributes materially to its fertilizing powers."—Dr. Paris's *Memoir in the Transactions of the Royal Geological Society of Cornwall*, vol. 1. 8vo. London, 1818, page 193.

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## AGRICULTURAL INTELLIGENCE.

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ROXBURY, JUNE 8, 1825.

COMPARISON OF THE PRESENT SEASON WITH FORMER ONES,  
AND THE AGRICULTURAL PROSPECTS OF THE YEAR.

**F**REQUENT accounts of the state and progress of vegetation are interesting to farmers. They are interesting by enabling us to compare one portion of the country with other parts—and by affording early information as to the failure or abundance of crops, they may influence our sales of produce, and even our cultivation. If, for example, it could be ascertained in June, that there would be a short crop of hay, it might induce farmers to try millet, which may be sown early in July, and yield an abundant supply of fodder, or to increase their quantity of root culture. There is also pleasure, if not profit, in comparing one season with another. Those who come after us, also, will have the means of ascertaining whether any material changes have taken place in the climate either for the better or worse. It is well known, that the past winter of 1824-5, was.

throughout the United States and Europe, an unusually mild one—and few springs ever opened earlier or under more auspicious prospects. This character of unusual earliness it still retains, and we have reason to be grateful, that it has not been followed by late frosts, fatal to fruits and to tender cultivated vegetables. The flowering, or as it is technically called, the blossoming of all sorts of fruits was most abundant, and even the more delicate sorts, and all the hardy ones, have set well. If there is any danger, it is that of an *overloading* of the fruit trees, a circumstance not so much regretted as it ought to be. This overbearing is alike hurtful to the tree and to the quality of the fruit, and the European cultivators so fully understand this, that it forms no unimportant part of their care to mitigate the evil by taking off one half or two-thirds of the fruit in an early stage, in very abundant years.

The prospect of grass on the 1st of May was very fine. The winter had killed none. It sprung up very thick, and promised well—but a drought through the whole of May, and the first days of June has, it is believed, materially and essentially injured the crop. A drought in any latter month is not half so fatal. On dry shallow soils, and on old fields, the crop will be lessened from one third to one half. The late refreshing rains of the 5th and 6th of June cannot save the crops on early and dry lands, though they will much increase the crop on other soils, and thus diminish the evil. Hay, however, promises to be a dear article the next year as it has been the last.

*Full comparison of the present Season with several former ones.  
so as to enable our readers to make an average.*

#### FLOWERING OF VARIOUS PLANTS AND EARLY GARDEN PRODUCTS.

Apricot opened its first blossoms in 1815, May 1; in 1816 April 29, in 1822 April 21, in 1823 April 20, in 1825 April 11, nine days earlier than the earliest season enumerated.

Cherries opened their first flowers in 1813 May 18, in 1815 May 10, in 1816 May 6, in 1822 May 1, in 1823 May 7, in 1824 May 1, in 1825 April 23, seven days earlier than the earliest season.

Pears opened their first flowers in 1813 May 20, in 1815 May 20, in 1816 May 12, in 1822 May 5, in 1823 May 3, in 1824 May 4, in 1825 April 30.

Apples opened their first flowers in 1813 May 23, in 1815 May 25, in 1816 May 12, in 1822 May 9, in 1823 May 19, in 1824 May 11, in 1825 May 8.

Asparagus first cut in 1813 May 14, in 1815 May 6, in 1816 May 5, in 1822 May 1, in 1823 May 5, in 1824 April 28, in 1825 April 20.

Green Peas first gathered in 1813 June 19, in 1815 June 21, in 1822 June 6, in 1824 June 11, in 1825 June 5, were fit June 3.

These items are not one half of the variety of plants to which my notices and records extend, but they are sufficient to show that this season is the most early we have had for a great number of years. It is to be remembered, that we always refer to the same individual trees every year without which the comparison would be idle. In some estates the same sorts of fruits might flower a week earlier or a week later, but by constant reference to the same tree you obtain the true state of vegetation for the season.

A FARMER.

ADMIRAL Sir Isaac Coffin, whose munificence, and of whose zeal to promote the interests of his native state we have repeatedly had occasion to take notice and to commend, has, with untiring generosity, added another favour to the cause of Agriculture. He has ordered a stallion and mare of the Cleaveland Bays, and he insists upon sending them out free of any expense to the Massachusetts Society for promoting Agriculture, except freight. We have seen the correspondence between the Admiral and his friend the celebrated breeder of short horned cattle and of the Cleaveland Bays, Mr. Wetherell, which confirms the opinion we had before of the liberal spirit of the Admiral. Mr. Wetherell tells him "he has no horse of proper age; that such an one would cost from £200 to £500 (from 900 to 1400 dollars)—that he has 2 year old colts, very fine, which could be had for 500 dollars." The Admiral replied "You are a better judge than I am whether the 2 year old colts will stand the voyage. I wish to have the best at any rate—my design being to benefit my native state, a few hundred dollars one way or the other would not be considered as of moment."

The Cleaveland Bays, are, we believe, derived from a cross of the English hunter with the Hanoverian or Flemish heavy mares;—we are not, however, certain of this fact. They are a large race of horses, very celebrated for the carriage—remarkable for activity, (considering their size) strength, and hardihood. Such, at least is the character given of them by British writers. Their colour uniformly bright bay—their figures showy, and their carriage and gaits noble. They are exactly calculated for coaches, and our new four-wheeled *one-horse* carriages, which the French, fond of ridicule, call "*demi-fortunes*"—or *half fortune* carriages



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